



Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at <http://about.jstor.org/participate-jstor/individuals/early-journal-content>.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

Journal of the Society of Arts.

FRIDAY, NOVEMBER 30, 1860.

INTERNATIONAL EXHIBITION OF
1862.

The correspondence between the Commissioners for the Exhibition of 1851, the Society of Arts, and the Trustees for conducting the Exhibition of 1862, has been brought to a satisfactory conclusion, as will be seen by the accompanying letter, addressed to the Secretary of the Society of Arts. This correspondence has had relation to the site for the building, the provision of the necessary funds, the incorporation of the Trustees by the authority of the Crown, and their relations with the Commissioners for the Exhibition of 1851 :—

London, November 22nd, 1860.

SIR,—We have to acknowledge the receipt of your letter of yesterday, enclosing the copy of a communication from Her Majesty's Commissioners for the Exhibition of 1851 to the Council of the Society of Arts, in which the Commissioners express their general approval of the object which the Society has in view in organising the Exhibition of 1862, and their willingness to render such support and assistance to the undertaking as may be consistent with their position as a chartered body, and with the powers conferred upon them by their Charter of Incorporation.

Under these circumstances we have to request that you will intimate to the Council of the Society of Arts our willingness to accept the Trust which the Council and the Guarantors have in so flattering a manner expressed a wish to repose in us, on the understanding that the Council will forthwith take measures for giving legal effect to the Guarantee, and for obtaining a Charter of Incorporation satisfactory to us.

We have the honour to be,

Sir,

Your obedient servants,

(Signed)

GRANVILLE,
CHANDOS,
THOMAS BARING,
C. WENTWORTH DILKE,
THOMAS FAIRBAIRN.

P. Le Neve Foster, Esq.,
Secretary to the Society of Arts.

The Guarantee List includes 662 persons, and the sum guaranteed now amounts to £366,800. The Commissioners for the Exhibition of 1851 have granted a site for the building on their estate at South Kensington.

SECOND ORDINARY MEETING.

WEDNESDAY, NOVEMBER 28, 1850.

The second Ordinary Meeting of the One Hundred-and-Seventh Session was held on Wednesday, the 28th inst., Professor Owen, F.R.S., in the chair.

The following gentlemen were proposed for election as Members of the Society :—

Chandos, Marquis of	Wootton, near Aylesbury.
Cornforth, John	Berkley-street Mills, Birmingham.
Fairbairn, Thomas	Northwood, Manchester.
Hunt, John	156, New Bond-street, W.
Millar, John, M.D.	Bethnal-house, Cambridge-heath, N.E.
Nicholls, G. P.	Aldine-chambers, Paternoster-row, E.C.
Roskell, Robert	156, New Bond-street, W.
Yolland, Col. W., R.E....	17, Westbourne-park, W.

The following Institutions have been taken into Union since the last announcement :—

Worcestershire Union of Educational Institutes.
Andersonian University Popular Evening Classes, Glasgow

The Paper read was—

ON THE ACCLIMATISATION OF ANIMALS.

By F. T. BUCKLAND, M.A., STUDENT OF CHRIST CHURCH, OXFORD, ASSISTANT-SURGEON, SECOND LIFE GUARDS.

In the present days of progressive movements we find that knowledge of details, and experience of facts, are collected into one focus, and made to bear upon the object aimed at by the means and operations of societies. We have amongst us societies which take cognizance of, survey, and reduce to practice almost every branch of human knowledge, whether in Science or in Art.

There is, however, one subject which until the last few months would seem to have escaped the busy minds of our fellow-countrymen, I mean the art and science of Acclimatisation, a term which may be said to comprehend the art of discovering animals, beasts, birds, fishes, insects, plants, and other natural products, and utilizing them in places where they were unknown before.

The importance of this art has not escaped our neighbours the French; and in Paris there has been established, since the year 1854, a society called "La Société Impériale d'Acclimatation," of which I shall have more to say hereafter in the progress of this paper. But it may be asked, what is the use of acclimatizing animals in *this* country? have we not already the best that the world can procure? The answer is, you may think you have the best, but good is the best, till something superior is discovered.

On 22nd January, 1860, I had the good fortune to be invited to a dinner, which will, I trust, hereafter form the date of an epoch in natural history—I mean the now celebrated Eland dinner, when for the first time the freshly-killed haunch of an African beast was placed on the table of the Aldersgate Tavern.

The savoury smell of the roasted beast seemed to have pervaded the naturalist world, for a goodly company were assembled all eager for the experiment. At the head of the table sat Professor Owen himself, his 'scalpel' turned into a carving-knife; and his gustatory "apparatus" in full working order.

It was indeed a Zoological dinner, to which each of the four points of the compass had sent its contribution. We had a large pike from the west, American partridges shot but a few days ago in the dense woods of the

transatlantic east), a wild Goose (probably a young bean-goose) from the north, and an Eland from the south. The assembled company—the ardent lovers of nature in all her works—most of them distinguished in their individual departments.

The gastronomic trial over, we next enjoyed an intellectual feast in hearing from the Professor his satisfaction at having been present at the inauguration festival of a new epoch in natural history. He put forth the benefits which would accrue to us by naturalizing animals from foreign parts—animals good for food, as well as ornamental to the park. The glades of South Africa have been described by numerous travellers as reminding them forcibly of the scenery of many of our English parks; and here were the first fruits of the experiment as to whether the indigenous animals of these distant climes would do well in our own latitudes. The experiment was entirely successful, and he hoped would lead to more, and that we might one day see troops of elands gracefully galloping over our green sward, and herds of Koodoos, and other representatives of the antelope family, which are so numerous in Africa, not only enjoying their existence in English parks, but added to the list of food good for the inhabitants of not only England, but Europe in general. The Vice-Chairman, the late Mr. Mitchell, then instanced the case of the Indian pheasants already in course of naturalization at several points in England, and expressed his conviction that the American partridges we had just partaken of, as well as the European Gelinotte, would thrive well in our woods and copses, particularly in Kent, and that there could not be any great difficulty in getting them over from America for this purpose. Elands, since the present experiment had become public, had been found to answer every expectation; 'they had risen in the market;' the demand much exceeded the supply, and there were numerous applicants for them, whose demands, he was sorry to say, the Zoological Society could not now satisfy. There were, however, plenty more elands in South Africa to be had for the trouble of importing them. A fresh supply was much wanted, and he trusted that this subject might be taken up by those who had convenient pasture ground for them in England, and who would be patriotic enough to further the important cause of the acclimatisation of useful exotic animals in English parks and homesteads.

Professor Owen himself, a few days afterwards, wrote a letter to the *Times*, in which he speaks highly of Eland as a meat, and advocates the cause of acclimatisation. These observations, both verbal and printed, of the learned Professor made a deep impression on all who read or heard, and I may add more especially on my own mind, for they showed us how that science, even in her gravest moods, bends to utility, and that there was a grand uncultivated field open to those who would take up the subject in earnest. Shortly afterwards there appeared a remarkable article in the *Edinburgh Review*, No. 224, Jan. 1860, upon the "Acclimatisation of Animals," which we have good reason to believe emanated from the pen of that most accomplished and practical naturalist, Mr. Mitchell, now, alas! no longer among us. This gentleman had evidently been struck with the idea of forming, in England, a society for acclimatisation, similar to that in Paris, which he had just undertaken to manage.

But before going further, I must beg to give an outline of this now justly celebrated society, which has been published, from the pen of an accomplished gentleman, in the columns of the *Field* newspaper. We learn that the Acclimatisation Society was formed at Paris, on the 10th of February, 1854; that, at least, was the date on which it took material form. It was presided over and addressed by M. Isidore Geoffroy Saint Hilaire, who, in a speech full of good sense and sound logic, unfolded the scheme of the society. He told them that the association they were about to form was, up to that day, without an example, that it was to be composed of agriculturists, naturalists, landowners, all the scientific men, not only of

France, but of every civilised country, all of whom would aid in a work which required the help of everybody, because it was for the good of everybody. The prospect was, said he, nothing less than to people our fields, our forests, and our rivers with new guests; to increase and vary our alimentary resources, and to create other economical or additional products. In the vegetable kingdom much had already been done; but in the animal almost nothing. We have not one of those Mammifera which are so useful to the inhabitants of Asia and America, and to their indigenous game the French had added three species only—the rabbit, the kid, and the pheasant. M. Saint Hilaire then proceeded to point out that, although their ancestors had done much for them in adding to the aboriginal stock of animals and fowls, very few additions had been made in modern times. Immediately after the discovery of America, the Spaniards added a few birds to the European stock from the new continent, but no animal of any use to our farms or poultry-yards.

In its first proceedings the society was very modest. At the present time it numbers more than two thousand members, and includes within its roll thirty-five royal names, from the Emperor of the French to the King of Siam, from the Sovereign Pontiff to the Emperor of Brazil. It also possesses a splendid garden, more than 33 acres in extent, in the Bois de Boulogne, and every convenience and appliance for carrying out its principles.

The influence of the Society began to be very speedily felt, and in 1855 a report was presented to the members, from which it appeared that there had arisen in other parts of France a desire to form similar institutions, which were to be affiliated to the parent stem—a movement which was thought well worth the encouragement of the Society—which accordingly affiliated to itself the Zoological Society of Acclimatisation for the Region of the Alps. At the same time it took into correspondence various local and departmental agricultural societies, and determined to enlarge its plans, so as to admit the vegetable as well as the animal kingdom.

In the year 1858, however, it was resolved to take a step in advance, and obtain a garden of an extent sufficient for the purposes of the Society. Thanks to the concurrence of the Imperial Government, and of the Municipality of the City of Paris, this was easily managed, and a space of ground in the Bois de Boulogne, nearly three times as large as the Zoological Gardens in the Regent's-park, was placed at the disposal of the Society.

Perhaps the best exemplification of the manner in which the French Acclimatization Society set to work, is afforded by the list of prizes which they offered to the competition of the members in the year 1857. It was as follows:—

1. A medal worth £80, for introducing into the mountains of Europe or Algeria a flock of pure Alpacas (*Auchenio paca*). The flock must consist of three males and nine females at the least.

2. A medal worth £40, for the complete domestication, application to agriculture, or employment in towns of the Kiang (*Equus hemionus*), a valuable beast of burden, of great power and swiftness, which belongs to Thibet, or the peetsi (*Asinus Burchelli*), a South African animal, nearly allied to the zebra, but much resembling the horse. The domestication includes reproduction in captivity.

3. A medal worth £40, for the domestication and multiplication of some large species of kangaroo—*Macropus giganteus*, *M. fuliginosus*, or some other species of a similar size. The winner of this prize must possess, at least, six specimens, and must have bred two generations in domesticity.

4. A medal worth £60, for the introduction and domestication of the Australian emu (*Dromaius Novæ Hollandiæ*), or the American ostrich (*Rhea Americana*). To this are attached the same conditions as the preceding prize.

5. A medal worth £40, for the domestication of the great bustard (*Ovis tarda*). To obtain this prize six adult

specimens must be produced which have been reared in domesticity.

6. A medal worth £20, for the domestication and acclimatization of some new bird of game. Exception taken against all those birds that will injure crops. [Which exception, if severely construed, seems to us as tantamount to a prohibition.]

7. A medal worth £20 for the introduction of an eatable fish into the sweet or brackish water of Algeria.

8. A medal worth £40 for the complete acclimatisation of some new species of silkworm producing silk that may be spun.

9. A medal worth £20 for the acclimatisation in Europe, or in Algeria, of some wax-producing insect, not a bee.

10. A medal worth £20 for new varieties of the Chinese Yam (*Dioscorea batatas*) superior to those which have already been obtained, and easier of cultivation.

11. A medal worth £60 for the introduction, cultivation, and acclimatisation of the quinine (*Cinchona*) in Europe, or any of the European colonies.

To this list was added, by the private enterprise of M. Chagot, a member of the society, a prize of £80 for the domestication the African ostrich (*Struthio camelus*) in France, in Algeria, or in Senegal, it being necessary to produce from two or more ostriches at least two generations, and at least six specimens hatched in a state of domestication, the method of reproduction being as explicable as that of any other bird in the poultry yard.

Thus, we find that in its earliest operations the society paid the greatest attention to increasing the vegetable wealth of the country, not forgetting, meanwhile, its principal and even more important duty—that of gaining acquisitions in the animal kingdom.

The proceedings of this valuable Society are now published monthly, and we find in these pages many articles of the most valuable description on the details of acclimatization; correspondence from all parts of the world, and references to books which bear upon the subjects undertaken. I have not space for an analysis of the various and important branches of human knowledge, which, but for the efforts of this society, would most probably be lost to the public welfare.

This, then, is an imperfect outline of the plan of the society which Mr. Mitchell left us to superintend. He has, however, left us a valuable legacy of the before-named article in the *Edinburgh Review*, in which he seems to have put forth his ideas of acclimatization, as applied to our own country; and as this paper contains so many valuable hints from long experience, that experience I feel it incumbent upon me to put forth in many of the ideas as to details, that honour should be given where honour is due. He begins with a passage from Lord Bacon, who, among the inventions of the island Atlantides, shadows forth the practice of acclimatization, in the following words:—

“We have also parks and enclosures of all sorts of beasts and birds, which we use not only for view or rareness, but likewise for dissections and trials, that thereby we may take light what may be wrought on the body of man; wherein we find many strange effects; as continuing life in them, though divers parts, which you account vital, be perished and taken forth; resuscitating of some that seemed dead in appearance, and the like. We also try poisons and other medicines upon them, as well of surgery as physic. By art, likewise, we make them greater or taller than their kind is, and contrariwise dwarf them and stay their growth. We make them more fruitful and bearing than their kind is, and contrariwise barren and not generative. Also, we make them differ in colour, shape, activity, many ways. We find means to make commixtures of divers kinds, which has produced many new kinds, and them not barren, as the general opinion is..... We have also particular pools, where we make trials upon fishes, as we have said before of beasts and birds. We have also places for breed and generation of those kind of worms and flies which are of special use, such as are with you your silkworms and bees.”

Having enumerated the various so-called zoological gardens in Europe, Mr. Mitchell states of them that they

have addressed themselves rather to mere exhibition than to reproduction and acclimatization, and then startles us with the astonishing fact that since the Christian era the only additions to our catalogue of domesticated animals have been four in number, viz.:—

In 1524 the turkey.

In 1650 the musk duck.

In 1725 the gold pheasant.

In 1740 the silver pheasant.

Here then is an answer to the question of the sceptic who believes we have the best of every thing; and if he be a gastronome, we appeal to that love of good feeding which we all have more or less, and ask him, if it were not for the acts of acclimatization which took place in 1524 and 1725, what would he have for dinner on Christmas-day to face the roast beef, and where would his pheasants be which he takes so much pride in preserving in his coverts.

Now if we were to order a taxidermist to set up and prepare a series of all the animals *we use* in England, whether for food or for ornament, we should, I think, state that they might be all placed in a comparatively small space. But let us walk along those marvellous galleries of the British Museum which are devoted to zoology, and we shall then see how plentifully the world is stocked with life, and how little use we have made of that life; nay, we may go even to the geological gallery and find the bones of creatures which have long been extinct in this country, but whose representatives still enjoy life in distant climates.

In fact, to reduce this matter to figures, the learned President of the Acclimatization Society in Paris tell us that the world furnishes a list of no less than one hundred and forty thousand animals, and out of this vast catalogue we limit our attention to the small number of forty-three.

I now propose to examine into this catalogue of animal life, and to see which among the numerous individuals composing it we can point out as likely to be of future use to us. I shall not do this at random, but taking as my guides the observations of Mr. Mitchell in the Edinburgh article, and also the guide of the gardens of the Zoological Society of London, I shall endeavour to point out those animals and birds which from actual experience have been proved to live in this country, and also to multiply their species. There being no reason why, having once bred, they shall not breed and multiply again.

THE ELAND.

To begin with what may well be called the most noble, the largest, the heaviest, and the most useful of the deer tribe, we may well instance the eland, of which I have the opportunity of showing you a magnificent head, through the kindness of Mr. Roberts, furrier, of Regent-street. As Mr. Mitchell justly observes:—“The eland is the *gibier par excellence* of the South African wilderness; his brisket is ‘the dainty bit they set before the King.’ Every travelling sportsman in Caffraria agrees upon the fine quality of this meat, and a trial made in England in the beginning of last year, under very unfavourable circumstances, fully confirms all that they have said, for the Eland is no longer exclusively African.”

In the catalogue of the animals living at Knowsley when the late Earl of Derby died, in 1851, figured five elands, two males and three females, one of which had been born there. The Zoological Society succeeded to this little herd by bequest. The noble collector had been their President for more than twenty years. He had witnessed the decline of the establishment in the Regent’s-park to all but inanition in 1847 with regret, and had rejoiced in the subsequent resuscitation which the Council, in their last report, have candidly and handsomely acknowledged to be due to the exertions and ability of their former secretary, Mr. Mitchell. Desirous of marking his sympathy with this management, Lord Derby directed

that whatever group of animals should be considered most eligible for the purpose of acclimatisation, at the time of his death, should be transferred from the Knowsley collection in its entirety to the Society's possession. By the advice of Mr. Mitchell, the elands were most judiciously chosen, and the result has justified all the expectations which he formed of them. The progress of this acclimatisation, which is now perfected, is related in a short paper published in the "Bulletin de la Société Impériale d'Acclimatation," and subsequently noticed in the report of the Society, read at their last anniversary. It appears, from the table given in this document, that up to the 29th of April last twenty eland calves had been produced in England from the Knowsley stock, independently of any which may have been obtained from three of the earliest born females, which were exported to the Continent. If the whole number had been kept together up to this time, as I was, we believe, the intention of Mr. Mitchell, the undated herd would not count less than thirty head. With such a commencement, it is clear that the progress of this interesting labour would have gone on much more rapidly; and that the next five years, instead of ten, would have made the eland not uncommon in our parks.

The merit of the first step towards the acclimatisation of the eland in England is incontestably due to the late Lord Derby. More than twelve years ago his first importation arrived. They bred; but he unfortunately parted with a male. Accident reduced his stock to single female, who remained barren. Nothing discouraged, he recommenced, and in 1851 the animals, so soon transferred to the Zoological Society, arrived—the female in February, the male in July. They were young, and their first calf was not born until 1853—since then the work has proceeded with great success.

Herds of this noble antelope have been founded at Hawkstone, by Viscount Hill; at Taymouth, by the Marquis of Breadalbane; and at Tatton, by Lord Egerton. The stock of the society is still very strong and vigorous, and will, if well managed, continue to supply the nucleus of future home-bred herds—for which applications are constantly made—for years to come.

Lord Hill was the first to profit by the opportunity offered by the society, and he has no less than eight of these animals roaming in his deer park, after having slaughtered a six-year-old male for the table in January last. Though anything but fat, this first essay of the quality of English eland venison satisfactorily corroborated the character unanimously given to it by African sportsmen, travellers, and colonists; the verdicts were taken in not a few gastronomic laboratories—royal, noble, and scientific.*

Nothing can be more stately than the eland, leading out his family along the lovely slopes of Hawkstone, where "a great rocky ridge rises in the midst of the park,

and stretches nearly through it, affording every variety of shelter. There the pale tawny flanks of the antelope glisten in the morning light; infinitely surpassing the dun deer in colour, while they rival them in grace, and their great size makes them immediate objects of attention. Their clean, small legs, full of power, push them over hill and dale at a tremendous pace; and if an obstacle opposes, their faculty of leaping is almost incredible compared with their weight."

In order to bring the information relative to the breeding of the eland up to the last moment, I took the liberty of writing to Lord Hill, who most kindly sent me, a day or two ago, the following particulars:—"The elands are going on very satisfactorily, notwithstanding the wet and cold they have been exposed to during the last summer, having no shed or indulgence of any kind since they were turned out in the park in May; they are, however, now in a large paddock with a shed in it. I have been most successful in breeding and rearing them, not having lost one. I have now six females and three males, and I hope four of them are in fawn, which will make a good herd next season." By the kindness of Mr. Bartlett, I am enabled to give the present stock of elands in the Zoological Society's Gardens, viz.:—five females and one male, all doing well, and in good health.

Here, then, we have good evidence that elands will do well in this country. Let us hope that some day they may become so common as to be used for ordinary butcher's meat.

After the elands, I must not omit to mention the smaller of the antelopes. I may mention the Leucoryx, the Gnu, the various kinds of gazelles, and several others, many kinds of which I am enabled to show this evening through the kindness of Mr. Bartlett and Mr. Leadbeater. Those who wish to see admirable and spirited pictures of the heads and horns of these can do so by referring to Routledge's Natural History, by the Rev. J. Wood, parts xiv., xv., xvi., Vol. I.

Antelopes are delicate things to rear, but yet we find recorded that the harnessed antelope "breeds freely in confinement," as will most probably the Boschbok. The springbok will also live in our parks, and we find a history of them recorded as living in Lord Hill's park, by Mr. Mitchell.

Among the antelope family, as an ornamental animal nothing can excel the eland, except perhaps the Koodoo, which under similar treatment might be acclimatised with equal certainty. As an addition to our economical resources it appears to be in no way inferior. It combines extraordinary quality of flesh with rapid growth, fecundity, and hardiness, in which it is not exceeded by our best short horns, which on the other hand very often fail to reproduce, through excess of fattening property, or from too closely related blood. The great difficulty in these antelopes is their liability to cold, but there is no reason why with shelter and care an attempt should not be made to keep them.

I now pass on to the deer tribe. We know how many thousands of pounds are annually expended in preserving the deer forests of Scotland, and with what result. Compare the comparatively pigmy heads which are brought home by our sportsmen with the heads of deer that do not live, in these days of steam, an immeasurable distance from the deer forests, and are by no means difficult to procure through the proper channels.

If we examine an Ordinance map, how many green spots shall we observe indicating the parks of noblemen and rich proprietors, many admirably suited for deer. Now, out of the deer family, how many are there now in England? but three, viz., the red deer, the fallow deer, and the roebuck. It may well be asked how many of the deer tribe are there on the face of the earth, and why have we so few in England?

The answer is given by Mr. Mitchell, who writes:—"Out of forty-two species of deer, exclusive of the little

* The following is a note on eland and eland venison, by the Hon. J. Berkeley:—"The elands are at present in a paddock at Taymouth Castle, in the park of the black deer. They do very well; and there are at this moment two young ones bred there, who seem to be perfectly acclimatised. There is no sort of reason why they should not do well in all our parks, chases, and forests, as, when at large, there would be no more danger in them to man than in the red deer. As to the editorial remark appended to the question asked by A. B. in the last *Field*, the trial, at the dinner alluded to, of the flesh of the eland was not a fair one; the eland then dressed was not in season, and therefore no decisive opinion could have been formed as to fat, flesh, or flavour. In passing, I would observe that it is confinement or being in a half tame state, that makes animals dangerous to man. The common fallow deer is so when reared by hand. The bison, the eland, the wapiti, the elk, the American antelope, if acclimatised and permitted to run wild in large parks or forests, would fly the presence of man; and my opinion is that the elk, from his knowledge of and ability to clear away the snow, would thrive in the Highland deer forests. These, and thousands of other animals and birds, domestic and wild, might be made available to the United Kingdom by the labours of the Acclimatisation Society."

moose deer of Tropical India, there is hardly one which would not adapt itself to our seasons."

First, as regards stags, there is no reason why the red deer of Scotland should not be crossed with the stag of the Odenwald, and those that, as Mr. Mitchell says, are at home in the woodlands of Central Europe, and thence eastward to the Carpathians.

Then, we have the wapiti, a magnificent deer, a native of the northern parts of America, of which I have the opportunity of showing a fine head, brought by the Hon. G. Berkeley, from America. This animal, be it remarked, "breeds every year in the Society's Menageries," and there is no reason why it should not be added, as an ornament, in many of our English parks, where there is room and proper food for it.

Then we have, in the catalogue, the Barbary deer (*Cervus-Barbarus*). This is the representative of our red deer on the southern shores of the Mediterranean. "The stag and hind, now in the gardens, were presented from the fine herd of this deer which adorns Lord Hill's park, at Hawkstone."

After the Barbary deer, we find the *Barasinghai Cervus Duvancellii*, first imported by the Earl of Derby, a native of Nepaul and Assam. Its winter coat is of a dullish grey, but in summer it changes to a brilliant golden hue, which would make the barasingha the most interesting addition which could possibly be introduced into a heavily-wooded park. Lord Hill, in a letter to myself a few days ago, writes,—"I have also a number of Barbary deer, about 16, and Sambur (another kind of deer), in the park, and these are doing very well." And then, what is most important, his lordship says none of them appear to interfere with the fallow deer, or the other stock.

There is, besides these, a very hardy deer, which breeds well in confinement, and whose home is in North America, I mean the Virginian deer. This animal would do exceedingly well in Scotland, is not difficult to procure, and is cheap in price; in fact, there is a pair of them in London for sale at this moment. There are other deer whose names must be mentioned, viz.:—a deer, nearly as large as the Bavaongha, which is found in Yucatan; a deer from South America (the *Blastocerus Paludosus*), a hardy little species, which is marked with a white circle round the eye. A roe, as large as a fallow deer, the Gemul of Moteria Molina, as well as the Tartarian roe.

Next to the wapiti, in size and beauty of antler, comes the Persian deer—*Cervus Wallachi*. I have also, through the kindness of Mr. Leadbeater, a fine head of this animal to show to the Society. This animal also will breed in England, for we read "The animals were ultimately sent to the Earl of Ducie, who, after keeping them three seasons, most liberally presented them (October, 1860) to the society." The two females now in the society's possession are both accompanied by their fawns, and there seems every probability of this fine species being permanently established. A few weeks ago (October 8, 1860) Viscount Powerscourt was kind enough to send me a catalogue of the deer, &c., in his park at Powerscourt, near Dublin. This nobleman is a most active promoter of the society, and his great success shows how much individual exertion may do. He has now in his park one bull nylgau, one cow ditto; two stag wapiti, three hind ditto; one Barbary stag, one hind ditto; one Sambur deer, six hinds ditto; one axis stag, two hinds ditto; one male llama, one female ditto; one white hind; and about thirty-five red deer; all these are in good health, and the nylgaus and deer breeding well.

Not many hundred miles from England lives the reindeer; from our earliest infancy we have heard of the great benefit the poor Laplanders derive from it—in a domesticated state they drink its milk; they clothe themselves with the skins; they eat its flesh, and use its sinews and horns; and all the time they use it as a beast of burthen, and drive about in sledges drawn by it. The English sportsman derives excellent sport in pursuing the reindeer in its wild state.

Here then is a beast which recommends itself to the owners of parks and deer forests, to the farmer, and, I was going to say, the cabman also. The Dutch have stolen a march upon us in this respect, for Mr. Bartlett tells me that in a recent visit to Holland he saw them in a state of domestication, and that they do well.

It is, I believe, an absolute requisite for the reindeer that it be not kept on a clay soil; the soil upon which they thrive and breed in Holland is sandy.

Who has not heard of the Moose deer, or elk of Canada, and mentally followed the hunter in his active foot-race after the animal, or enjoyed the scene, where in a cold frosty night, with the air so still that a crack of a twig can be heard for half a mile, the sportsman lies secreted, from time to time calling the moose through his trumpet of birch bark. I show on the walls the result of this exciting sport, a magnificent head kindly lent me by Mr. Leadbeater, and am inclined to put the question—Why should there not be moose in those parts of England which are suited to them? and why should the English sportsman have to traverse the vast Atlantic to obtain a shot at one of these noble animals?

It often happens that one entire race of men is, for the most part, dependent upon a race of animals, and we have a good example of this in the North American Indian, who derives much of his sustenance from the great bison of the prairies. Every one has read and heard of the vast herds of these animals that are annually pursued and hunted down, yet seem hardly to diminish in numbers. English sportsmen make special expeditions in search of these, and within the last few months the Hon. Grantley Berkeley has returned from an expedition which he undertook solely to kill these animals. He has brought home with him the magnificent trophy which, through the kindness of the Editor of the *Field*, I am now enabled to show you. What a magnificent animal for our English parks; it is not only ornamental, but also exhibits qualities which would in some persons' eyes give it greater charms. It is good to eat, and carries a hump on its shoulders, a taste of which would be quite sufficient to impress on the minds of our *gourmants* the necessity of becoming a convert to the acclimatisation of animals.

I need not refer to printed records as to whether the bison will live in this country or not. It is a fact accomplished. The Great Northern Railway will, with the permission of that noble-minded encourager of acclimatization, the Earl of Breadalbane, carry us not many miles from a magnificent park where we may see the shaggy monster of the prairies cropping Scottish grass, and watched by Scottish keepers, and thriving well (like most foreigners) upon the fat of our favoured land. Our worthy friend, *Punch*, has unknowingly given us a helping hand in our desire to acclimatize this beast, for he has given us a capital caricature, which not only makes us laugh, but confirms, throughout the length and breadth of the land, the fact, should it ever be doubted hereafter, that bison live in Scotland, A.D. 1860.

I must not forget to mention in this place those noble beasts the Aurochs, of Russia. A pair of these, as we well know, were, through the interest of Sir Roderick Murchison, sent by the Emperor of Russia, to the Zoological Gardens, where they might be alive now if a murrain, which at that time was prevalent among cattle, had not unfortunately carried them off. We trust that we may yet see another pair in this country.

There is yet another beast that should be mentioned, the Yak, of Asia, of which we hear from the French Society, that a cross between it and the cow produces a hybrid, "a beautiful animal, which unites the good qualities of both parents."

From the deer tribe I now pass on to other mammalia. And first let us, according to the rule I have laid down, see whether we cannot restore any of the British beasts whose bones we find fossil. In many parts of England, in Norfolk, Suffolk, Berkshire, Cambridgeshire, and in Scotland, we find fossil bones of the beaver; nay, more, Professor Owen

writes, tradition refers the name and arms of the town of Beverley in Yorkshire to the fact of beavers having abounded in the neighbouring river Hull; and Pennant says that two or three waters in Wales still bear the name of Llyn-yr-assaŷ, or the beaver lake. Now there are situations in abundance in the above-named counties where there is a great lake or stream, where beavers would, I am convinced, if properly protected and looked after, again establish their species. We all know how interesting this pretty harmless water engineer is in his habits; the ladies know how useful his fur is, and the hunters tell us he makes a capital dish when properly cooked. The specimens are exhibited by Mr. Roberts, furrier, Regent-street.

There is, I think, a vacancy in our English parks and farms for another useful and ornamental animal, which might easily be procured from Australia. My hearers I see have anticipated me when I recommend the kangaroo to their notice. I will not dilate upon their merits, but ask my readers to examine the flock of them at the zoological gardens, and to hear what the able and energetic secretary of the Zoological Society, Mr. Sclater, says about them. Bennett's kangaroo is the most abundant species in Australia, extremely hardy, and much the best calculated for acclimatisation in an English park. In favourable localities it breeds with regularity, and with very little attention would rapidly increase in any of the Midland or southern counties, where the soil is dry and the character of the ground affords shelter from the north-east. Mr. Gould asserts the excellence of kangaroo venison as a meat for the table, and the introduction of these animals would therefore be something more than a mere zoological luxury. Mr. Gould has kindly lent me a specimen of this animal. The skin makes good leather. There are many places, he tells me, in England where it would thrive admirably.

But we must not forget to mention an animal which would be very useful in this country, if it would live, but I fear the climate of England is not suited for it. There is now in common use a substance which is called "alpaca," and much might be written and said upon this subject. I prefer, however, to quote the words of my friend, Dr. Lankester, who, in his admirable lectures on the uses of animals in relation to man,* thus writes:—

"But I now pass to a family of animals that has recently yielded a large increase to our cloth manufacture. I allude to the alpaca tribe or family, allied to the camels and dromedaries. When Pizarro conquered Peru, he found these animals employed as beasts of burden, and their wool used for making clothing. The Peruvian Government has placed an embargo upon the exportation of these creatures, so that we have only now and then seen them as curiosities in the collection of our Zoological Gardens; but in 1846, it appears, some of this wool found its way to Bradford.

"For the successful manufacture of this wool we are indebted to the energy and enterprise of Mr. Titus Salt, who, in the application of this material to the making of cloth, has succeeded in laying the foundation of one of the largest manufacturing establishments in this country, and has conferred a blessing upon his own country, as well as the countries in which the animal is reared.

"The length of the hair of the alpaca renders it of considerable value for mixing with goat's wool, silk, and other materials. There are four forms of these animals, very distinct from each other—the Llama, the Alpaca, the Vicugna, and the Guanaco. The Vicugna yields very fine hair, which is very much valued, but the Alpaca yields the most useful hair.

"I have mentioned the advantage of acclimatising other animals. There would be no difficulty apparently in acclimatising these animals in Australia, though where they have been tried in this country, the rot has seized them, because of the tenderness of their feet. A few months

ago, several Alpacas were secured, in spite of the jealousy of the Peruvian Government, somehow or another, and sent over to Australia, where they have arrived; and I understand that a first crop of wool has been secured, and that the flock is flourishing. Such experiments as these should be more extensively and systematically carried on, both in our country and in our colonies."

The alpacas were introduced into Australia by Mr. Charles Ledger. His brother has been kind enough to put into my hands some papers relative to this matter, and I trust that the particulars of this most important act of acclimatisation may be given to the public in the form of a book, for no one who has not read the history of these animals can have any idea of the immense difficulties, dangers from storm, pestilence, and famine—to say nothing of a very considerable loss of money—which this bold and enterprising man underwent to carry out a scheme which promises to be of the greatest importance to the most flourishing of our British colonies.

By the kindness of a friend in Paris, I am enabled to give, from an article, by M. Dupuis, in *La Patrie* of Sunday last, 25th November, a *résumé* of the animals, &c., now in the gardens of the Society at Paris, and learn that they now have, for the purposes of acclimatisation, examples of the following, viz.:—The hemione; a mule between this beast and an ass; pigs, from China; the peccory, from Brazil; the taper, from South America; a flock of llamas and alpacas, and of yaks, zebras, various kinds of antelopes and gazelles, goats, sheep, agouties, and kangaroos.

BIRDS.

We have not all of us got parks or large farms, but there are thousands of persons who, as our poultry shows tell us, not only have accommodation for the rearing and preserving of birds, but also take great interest in their welfare. It is, therefore, part of my plan to point out what new and interesting birds, according to the experience of the Zoological Society, will breed, and are capable of acclimatisation in this country—many of them may almost be said to have been partially acclimatised—but still, I give as full a list as I have been able to get together, and in each instance I give the authority of the Zoological gardens. I have not included the various foreign song-birds, which, however, might well be included in our category, as they afford occupation and amusement to many thousands of English men and women.

And first as regards the PHEASANTS, we must mention the CHEER (*Catreus wallichi*).—Being presented to her Majesty the Queen, it lived for several years in the Royal Gardens at Buckingham Palace, and there is, therefore, every prospect of the present birds doing well in the Society's establishment.

The MONAL (*Lophophorus impeyanus*).—The rich beauty of its plumage, its size, and the grotesqueness of its actions at particular periods, are equally remarkable; and when we add that it seems to be extremely apt to endure the conditions of confinement; that it breeds without difficulty under that disadvantage in this country; that it is perfectly capable of bearing the severest rigour of our winter, it certainly appears that the introduction of this mountain bird into the forests of Scotland is not only desirable, but ought ere long to be accomplished.*

The "Phasianus Versicolor," from Japan. The Torquatus, from China. It has been proved that both these birds will cross with our own pheasants, and produce hybrids of a greater size than either of the parents, and of a most beautiful plumage.

Continuing the pheasants. I am enabled, through the kindness of Mr. Leadbeater, to exhibit skins of the following beautiful birds:—

The PUCRASS (*Peucrasia Macrolophia*), the horned tra-

* Mr. Gould has kindly lent beautiful skins of these two birds for exhibition, as well as of their hybrids with the common pheasant.

gophon (a most desirable species for breeding), the KALEGE (*Euphrocotylus albocerasus*), the SNOW PARTRIDGE (*Tetrao-gallus Himalayensis*), all from the Himalayan range, and which would do well if we could procure them, and this is by no means impossible.

The PEACOCK PHEASANT (*Polypliction chinensis*).—Two pairs were transmitted in 1857, from the aviaries of the Babu Rajendra Mullick, of Calcutta, and the species having bred more than once in the collection of the late Earl of Derby, it is extremely desirable that this loss should be replaced.

Then, we endeavour to purvey for the farm-yards; and, first on the list stand the CURASSOWS, of which we learn that they number some dozen species, most of which have been proved to be capable of enduring the climate of England, with moderate protection; and some of them have reproduced, both at Knowsley and in the possession of the Zoological Society. The Dutch amateurs who flourished in the last century had so far acclimatised curassows in Holland, that they were not unfrequently brought to table; and, at the present time, several instances are known both of curassows and guans breeding freely in the neighbourhood of Paris.

Nor must we omit the OSCELLATED TURKEY (*Meleagris ocellata*). Should a sufficient number of specimens be obtained, although it is certainly more delicate than the turkeys of Mexico and of the States, there is no reason to fear want of success in acclimatising it.

THE CUBAN COLIN (*Ortyx cubensis*), THE WELCOME COLIN (*Ortyx neoxenus*), the CALIFORNIAN COLIN (*Callipepla Californica*).—These are all extremely prolific, and exceedingly disposed to reproduce in confinement; so that there will apparently be but little difficulty in acclimatising all those species which are indigenous to temperate regions.

The Californian colin is one of the most beautiful of the family, and is so naturally tame, that it has been known to breed freely in a cage, in the centre of Paris. It is perfectly hardy, and, as it is now becoming pretty numerous in collections, the day is probably not far distant when complete success will be attained in the experiment, which has been already commenced by a noble member of the Society to establish it as a game bird in this country.*

THE CRESTED GUINEA FOWL (*Numida cristata*).—I mention it in the hope that some further information, and other specimens may be obtained, by the notice of residents in West Africa being called to the bird, which would certainly make a very interesting addition to our poultry yards.

A most important bird next calls for notice, viz., the BRUSH TURKEY or TALEGALLA, of which, by the kindness of Mr. Gould, I am enabled to show you a fine skin. I have not time to give any details of the interesting mound making habits of this Turkey, so aptly described by Mr. Gould, in his magnificent work on "The Birds of Australia." This bird has made its curious nest and reared its young in the Zoological Gardens.

Again, we have, as before-mentioned, the GELINOTTE or HAZEL HEN, of the Germans. This would breed and do well in many parts of England, particularly in Kent.

THE RED-BACKED PARAKEET AND CRESTED GRASS PARAKEET.—There is scarcely a doubt that all the species which inhabit the cooler parts of Australia would reproduce as certainly as those which are here mentioned, wherever space and congenial treatment can be afforded to them.

THE WONGA PIGEON (*Leucosarica picata*).—Australia is rich in pigeons, not less than twenty-one species being figured in Mr. Gould's work. Of these the most desirable to acclimatise in Europe is the wonga-wonga, and the most graceful is the crested dove. The

latter breeds very freely in confinement, when suitably accommodated. It is not only of considerable size, but, according to Mr. Gould's observation, a first-rate bird for the table, possessing a whiteness and delicacy of texture in its pectoral muscles, which are unapproached by any other species of this widely-spread and useful family.

THE CROWNED PIGEON (*Goura Coronata*).—These noble birds, although natives of New Guinea and its adjacent islands, not only bear the vicissitudes of our climate with the protection the aviary affords, but have almost every year re-produced in it.

And among water birds we find the following:—

THE PIED GOOSE (*Anseranas melanoleuca*).—A pair of these birds bred in the Gardens (in the pond 29) for the first time in 1859, and successfully reared four strong young birds.

THE WHITE-FACED SHIELDRAKE (*Casarca cana*).—As she is perfectly hardy, having survived all the subsequent winters without protection, and has laid almost every season, it is very much to be regretted that we have hitherto been unable to obtain additional specimens.

THE RED-BILLED DUCK (*Paeclonetta erythorhyncha*) breed pretty freely in confinement, and are very desirable additions, as they are perfectly hardy, and require no more attention than the ordinary waterfowl of Europe.

THE DUSKY DUCK (*Anas obscura*).—It breeds without difficulty in a suitable locality, and might easily be established in any district where it could be preserved for the first few seasons.

THE SOMMER DUCK (*Aix sponsa*).—This beautiful duck is now well known in Europe, many hundred pairs having been imported from the United States, and almost as many bred on the ornamental waters of this country. Like its congener, the mandarin duck, it is arboreal in its habits, and not only builds its nest, but lives for a considerable part of its time in trees when in a state of nature.

THE ASHY-HEADED GOOSE.—(*B. poliocephala*).—Both of these species are of great beauty, and are derived from the extreme southern limit of the American continent. They are perfectly hardy, and as the ashy-headed goose has increased rapidly since its introduction at Knowsley, in 1849, there is little room to doubt that the Upland goose will also, in a few years, become equally abundant in European collections. The genus to which these birds belong is closely allied to *Bernicla*, which includes the well-known Brent goose and *Bernicle*. They are rather terrestrial than aquatic in their habits, feeding almost entirely upon grass, which they graze with the closeness of a flock of sheep.

THE SANDWICH ISLAND GOOSE.—(*Bernicla Sandvicensis*).—From these two pairs the whole of the birds now in European collections are descended.

THE CEREOPSIS GOOSE.—(*Cereopsis novae-hollandiae*).—It breeds almost every year in the garden, laying its eggs in March, next after the Sandwich Island goose, which is the earliest species we have.

THE BEAN GOOSE found now only wild in England, but might be easily domesticated.

THE ROCK OR MAGELLANIC GOOSE (*B. Magellanica*).

THE SNOW GOOSE (*Antarctica*), both from the Falkland Islands, and which would breed well here.

THE BLACK SWAN, of which Mr. Gurney writes to me:—"The pair in my possession, at Carshalton, breed regularly twice a year, sometimes three times, and have in six years had about 131 eggs, hatched 83, and reared about 50."

THE BLACK NECKED SWANS which have reared their young in the Zoological Gardens.*

THE STANLEY CRANE.—(*Tetrapteryx paradisea*).—In the rich and varied collection of living animals which he subsequently accumulated at Knowsley, broods of this beautiful bird were hatched out on several occasions.

THE WHITE STORK.—(*Ciconia alba*).—The white stork is one of the most familiarly-known species of European

* Mr. Bartlett speaks most highly of this bird; it is very lively game, and amusing, and breeds well. One hen of his last year laid thirty-nine eggs, and they were all hatched under bantam fowls except two or three.

* For the exhibition of the skins of many of these birds I am again indebted to Mr. Leadeater.

birds, although in England it has, from the changes effected by improved agriculture, become comparatively rare.

THE MANTCHOURIAN CRANE.—(*Grus Montignesia*).—The birds which were taken to Paris by M. de Montigny, on his return from China, in 1854, have not only flourished there in the most perfect health, but have for three successive seasons made a nest and hatched out their young. The Manchourian crane is a favourite bird among the Chinese, and I believe that a considerable number of them are always in captivity at Pekin.

THE AUSTRALIAN CRANE.—(*Grus Australasiana*).—It evinces great aptitude for domestication, and is called there "the native companion," from the docility with which it accommodates itself to the society of man. Lord Powerscourt does not confine his attention to mammalia alone. He also cultivates various kinds of birds, and the following is his list:—Pair of Polish swans; one black-necked ditto; one black ditto; one ruddy sheldrake; two ditto Mandarin ducks; one pair Carolina ducks; one ditto Bahama ducks (and a good many of other kinds); one pair spur-wing geese; one ditto Egyptian geese; two ditto grey-leg geese (and several other kinds).

There is a useful bird which may suit the tastes of some persons who have accommodation, and, I may add, wish for it; it is not very ornamental, but it is useful; I mean the LAUGHING KINGFISHER (*Dacelo gigantea*) which may be taken as the type of a considerable group of kingfishers, which differ essentially in their habits from the lovely bird which flashes like a jewel along the brooks and rivulets of Europe. These powerful kingfishers of Australia seldom approach the water, but live in the dry scrub, and feed like birds of prey upon insects, reptiles, and small mammalia, instead of fish. The laughing kingfisher is excessively adroit in catching mice, and will wait as patiently as a cat at a hole whence he expects one to emerge. His note strangely resembles a rude powerful laugh, and the united efforts of the fine specimens confined in the aviary are heard far and near every morning. The regularity with which this laughter rings through the Australian forest at certain hours of the day, has not been unnoticed by the colonists, and among other trivial names for the bird, they have given it that of the "Settlers' Clock."

As among the mammalia, I have endeavoured to point out a quadruped which might again be restored to this country, so among birds I beg to suggest that there is no reason why an attempt should not be made to restore to those places where they once existed, that magnificent bird the bustard. He lived here once, and that in the memory of many persons now alive. Why should we not restore him (and I know where to obtain specimens), and place him in the preserves of Norfolk and on the plains of Salisbury? the old sport of coursing the bustard might again be revived, and the table might be supplied with a fresh delicacy.

We now come to another most important branch of acclimatisation.

CULTIVATION OF THE WATERS.

No English dinner is complete without a dish of fish; and fish-diet is in itself most digestible and nourishing, particularly for invalids. There are indeed many races of men whose sole sustenance is fish. Again, consider the thousands of persons whose sustenance depends upon the capture of fish. It is marvellous to behold the fleets of fishing-boats that annually follow the herrings in their migration along our coasts, and to examine the financial returns of this fishery. With reference to fish-culture in the sea, we can do but little, except as regards one important fact, which was not long ago mooted in the *Times*, viz., the necessity of looking sharply after the size of the meshes of the nets, to prevent the destruction of the young fry, but if we cannot do much for fish, surely there are such things as what are commonly called shell fish; need I name the oyster and the muscle. As regards the oyster

and the muscle, I have reference to several published facts to show that the cultivation of those articles of human food not only answers but even pays.

We then come to the cultivation of fresh-water fish, and this may be regarded in two points of view:—First, as regards the actual use of fish for food; secondly, as regards sport, and regulations for the anglers. Many persons laugh at the angler, and define him, according to Dr. Johnson's idea, as "a fool at one end, and a rod at the other;" but, mark you, we do not live in Dr. Johnson's time. Man's instinct for preying and destroying creatures, *feræ naturæ*, when unable to develop itself in fox-hunting or partridge-shooting, manifests itself in the love of angling.

This noble art has now reduced its maxims to a science. Hundreds of brains and hands are at work on this subject, whether it be fly-fishing or bottom-fishing; and in London alone there are fishing-tackle makers innumerable, whose business would cease to exist if they were not well-supported, and within the last few months a most important movement has taken place as regards the Thames, for by the exertions of the Thames Angling Preservation Society and their secretary, Mr. Farnell, the practice of netting has been abolished, and the fish are now protected from Kew-bridge to the City stone beyond Staines-bridge, and even higher up the river. I hear that netting is gradually becoming abolished. Besides this, by the kindness of the Duke of Rutland, the Right Hon. Sidney Herbert, and others, several trout and grayling have been introduced at various points of the river.

It is a happy provision of nature that there is a fish to be found adapted to almost every kind of water, from the lordly salmon of the mountain torrent to the humble eel of the stagnant ditch. Why should not we pay a little more attention to the habits of fish, and transfer fish suited for a certain kind of water into that water, supposing there to be none there already? Let us study the transport of fish, and utilize waters, whether great or small, which are now idle. The Dutchman does this; and he plants, so to speak, his canals with fish, and when the fruit is ripe he turns it into money. Were it otherwise, why should we find so many Dutch jack, perch, tench, and eels in Billingsgate Market, all commanding considerable prices?

Whether, therefore, we look upon fish as an article of food or as affording healthful sport at a cheap rate, it is necessary that we should look to the cultivation of the waters. I had here intended to quote a letter from Mr. Edward Wilson upon "utilising the waters," but I have not space for it. I do not wish to mutilate his admirable arguments. The best mode by which we can multiply fish is by the artificial reproduction of them, a mode long practised by the Chinese, and of late in several parts of England. Many may be inclined to laugh at the idea of hatching fish, but I beg to put forward an answer to them, which of all answers is the best—viz., that if properly carried out "fish-hatching will pay." Mr. Wilson tells us that "the annual value of salmon alone to Scotland is no less than £800,000 per annum, and to Ireland £300,000. With proper care of the young fish there is no reason why this large sum should not in time be doubled." I have lately visited the salmon-hatching ponds at Stormonfield, near Perth, and was surprised at the facility with which this process is carried out. This process is also going on at Lake Bearport, and other places in Canada. I have also an account of "The French Piscicultural establishment at Huningue, near Basle," by Mr. Thomas Ashworth, which is supplied by the water of the Rhine, and no less than five kinds of fish are principally cultivated—viz., salmon, trout, ombre, chevalier, and Danube salmon. From this establishment the fish are sent all over France, and will in time produce great national results.

We have all of us heard of the attempts made to introduce salmon into Australia; within the last few months a sum of no less than £600 has been spent upon the object; it has unfortunately failed, but Mr. Lloyd, the aqua-

rium dealer; of Portland-road, who has studied the subject of the transport of fish scientifically, says he is convinced that young salmon, if properly and scientifically watched during their long voyage, would arrive in safety.

There are many persons living who can recollect salmon being caught in the river Thames, and not many days ago a spawning fish was caught at Erith. We hail the appearance of this fish with glee. If one comes why not more. Why should not we assist nature, and hatch salmon artificially on the chance of restoring them to the Thames, though I myself, in common with several other persons, am sanguine enough to believe that we have more than a chance of restoring this noble fish to our beautiful river. Efforts are at this moment at work to obtain from the salmon spawning beds at Perth ova for the purpose of stocking other rivers, but I regret much to say that the Tay Commissioners have refused applications for the salmon ova, a fatal mistake. By giving them they would in reality lose no more than a person who gives a light to another from his burning candle; and by not allowing them to be taken they derive no advantage to their fishery, for a gentleman from Perth writes to me "at present we have salmon spawning in one ford from which as many ova are destroyed by trouts as would supply all that is wanted, and would no more impoverish the river than giving a handful of grain out of a granary full of corn." I trust the Tay Commissioners will withdraw their refusals of ova, and assist, not endeavour to arrest, the progress of pisciculture.

Of the science required for the raising fishes for the stocking of home waters, thus speaks Sir Humphrey Davy, in his delightful work *Salmonica*:—"The result is easily attained, and the difficulties are quite imaginary. The impregnation of the ova of fishes is performed out of the body, and it is only necessary to pour the seminal fluid from the milt upon the ova in water. Mr. Jacobi, a German gentleman, who made many years ago experiments on the increase of trout and salmon, informs us that the ova and milt of mature fish, recently dead, will produce living offspring. His plan for raising trout from the egg was a very simple one. He had a box made, with a small wire grating at one end in the cover, for admitting water from a fresh source or spring, and at the other end of the side of the box there were a number of holes, to allow the exit of the water; the bottom of the box was filled with pebbles and gravel of different sizes, which was kept covered with water that was always in motion. In November or the beginning of December, when the trout were in full maturity for spawning, and collected in the rivers for this purpose upon the beds of gravel, he caught the males and females in a net, and by pressure of his hands received the ova in a basin of water, and suffered the milt or seminal fluid to pass into the basin, and after they had remained a few minutes together, he introduced them upon the gravel in the box, which was placed under a source of fresh, cool, and pure water. In a few weeks the eggs burst, and the box was filled with an immense number of young trout, which had a small bag attached to the lower part of their body, containing a part of the yolk of the egg, which was still their nourishment. In this state they were easily carried from place to place, in confined portions of fresh water, for some days requiring apparently no food; but after a week the nourishment in their bag being exhausted, they began to seek their food in water and rapidly increased in size. As I have said before, Mr. Jacobi assures us that the experiment succeeded as well with mature fish that had been killed for the purpose of procuring the roe and the milt, these having been mixed together in cold water immediately after they were taken out of the body. I have had this experiment tried twice," continues Sir Humphrey, speaking in his own person, "and with perfect success, and it offers a very good mode of increasing to any extent the quantity of trout in rivers or lakes, for the young ones are preserved from the attacks of fishes and other voracious animals or insects, at the time when they are most easily destroyed and perfectly helpless. The same plan, I have no doubt, would

answer equally well with grayling and other varieties of the salmo genus. But in all experiments of this kind, the great principle is to have a constant current of fresh and aerated water running over the eggs."

What has been said of Canada by Mr. F. Forrester, in his "Fish and Fishing" (Bentley, 1849), will equally apply to many parts of this country.

There are thousands and tens of thousands of little tumbling transparent rills throughout this country—scarcely a farm without a dozen such—which have numerous natural basins in their courses, each of which, with the aid of a few hours' work employed in raising a timber dam, and applying a grate at the entrance and egress of the stream, would constitute as perfect a storepond for the making of such experiments as could be erected by the wealth of Croesus; with the advantage, too, of having the fish requisite for the tests existing, in a state of nature, within a few miles, perhaps within a few hundred yards, of the scene of action.* As an example of what has been done by the simplest possible apparatus, I would instance the introduction of the grayling into the Clyde by the Angling Club of Glasgow. In the *Field* of last Saturday, Nov. 24, is a description and also a plan of the process. Within the last few weeks, I have pointed out the advantages of pisciculture to a friend who has facilities, and who is at this moment engaged in laudable endeavours to hatch trout near Canterbury.

But we must not flatter ourselves that we are altogether about to introduce pisciculture as a novelty into this country.

In former days, when the inhabitants of this country were for the most part Roman Catholics, and, therefore, great eaters of fish, the cultivation of fish was looked after; and I would quote a good authority on this point:—

"That carp were introduced from the Continent to England by the monks is nearly certain; this, however, could be accomplished without recourse to any artificial modes of procuring or raising the young fry. There are, however, many and powerful reasons for believing that the grayling, the charr, the gwyniad, and perhaps also the vendace, the pollan, and the powan, were also introduced by the same agency from foreign countries. This belief is supported by the fact that these fish exist only in isolated and often distant waters, sometimes in only one or two neighbouring rivers, whereof that which contains them is apparently the least adapted to their habits, but always in such waters as had many or distinguished monastic institutions on their banks. While England was Catholic, great attention was paid to the raising and fattening of the choicest varieties of fresh-water fish, an art which sunk into neglect, partly owing, doubtless, to the abolition of fast-days, and partly to the great facility with which the finest sea-fish are now transported throughout the country.

"Even to this day, in Austria, Illyria, and parts of the Tyrol, the greatest attention is paid to the nurture of the most delicate fresh-water fishes in confined situations; and Sir Humphrey Davy states, in his *Salmonica*, that, 'at Admondt, in Styria, attached to the magnificent monastery of that name, are abundant ponds and reservoirs for every species of fresh-water fish, and the charr, grayling, and trout are preserved in different waters, covered, enclosed, and under lock and key.'

There is no reason why we should be behind our ancestors in this matter, therefore let us set to work and see what is to be done.†

* As it is impossible to go very much into the subject, I have given a list of books relating to the art of Pisciculture:—"Book of the Salmon," in two parts, by Ephemeræ (Longman and Brown, 1850); "*La Pisciculture et la Production des Sangsues*, par Jourdiere" (Hachette et Co., Paris, 1856); "*A Treatise on the Propagation of Salmon and other Fish*, Ashworth, (Simpkin and Marshall, 1853); "*On Pisciculture*," W. H. Fry, New York (to be obtained of the publisher, at 36, Soho square); and the two works of Boccius (Van Voorst, Paternoster-row).

† I have received information from Mr. Lloyd, of Portland-road, that in the hot summer of 1859, he sent out to the Can-

As regards insects and plants I have somewhat to say, but my limits will not allow me more space than to state that there exist many specimens of both; to instance in the one class the Ligurian bee, which Mr. Tegetmeier, secretary of the Apian Society, has already partially succeeded in acclimatizing. By the kindness of this gentleman I am enabled to show specimens of the bee. He gives it a most excellent character; it would be a great adjunct to our farm economy. As regards plants I have much to say, but I dare not break into this subject, which would require an evening to itself; suffice it to say, that there is an immense opening for the introduction of plants that would prove to be of the greatest use both to the poor and the rich.

I have now taken a hasty and summary survey of the animal kingdom, and have presented to your notice what facts I have been able to obtain relative to various beasts, birds, fishes, &c., which are capable of acclimatization. We have space and means, and food for many of them in our own favoured island; we know where they are, we can get them with interest, labour, and money, and when they arrive here we have, I am convinced, and actually know, many who will take charge of them. We, as Englishmen, are particularly lucky as to our chances of obtaining them. It is said the sun never sets upon the possessions of our most gracious Queen. English vessels are sailing daily to and from our colonies. Let us establish a system of interchange, receiving in return that which will be advantageous to us at home; for up to this time this country has been acting on the principle of "all give and no take;" we export thousands of our best living productions—how few do we import. We have all the crude materials provided by Nature herself; for an extensive scheme of acclimatization at hand, all we want is the interference of man, who shall apply energy and capital.

How then is this great object to be carried out. Individuals are comparatively powerless, but by means of a union of efforts, in the shape of a society, something might be done; at all events it is well worth a trial. The idea, therefore, having been started, took a tangible shape but a few months ago. The intelligent proprietor of the *Field* newspaper (a journal which opens its columns to the encouragement of that talent of observation and love of natural objects which we all of us instinctively possess), Mr. John Crockford, the Hon. Grantley Berkeley, and myself, held a consultation as to whether it was not possible to direct into one channel the many facts relating to the subject of acclimatization which were floating about, little heeded.

The Hon. Grantley Berkeley, as is well-known, is a gentleman who has devoted much of his life to the active pursuit of field sports, and during a long course of years he has devoted his attention, not solely to the *destruction* of animal life, but also to the accurate observation of facts relating to the creatures' natural habits and instincts—I may say social economy. This gentleman has kindly used his influence in obtaining the support of many noblemen and gentlemen, who have means and space for the work of acclimatization, and I am now able to present a long list of noble patrons, which, indeed, gives us great hope of ultimate success.

Added to this, Mr. Crockford most liberally gave us all the assistance he could afford by means of the press; and as for myself I have used, and hope always shall use my best energies, not only in starting, but also in keeping going the first public attempts at Acclimatization in England.

It was therefore determined to start at once a Society for the Acclimatization of Animals, and we held the first meeting on June 10, 1860. We have on our Council men

who are willing to devote their energies to the object. We have for Vice-President the Hon. Grantley Berkeley, and as Secretary your most obedient servant. Our plans are based upon those of the Société d'Acclimatation, and I have ventured to put forth the following programme, to show what are our plans of operation:—

The purposes of the society are—

1. The introduction, acclimatization, and domestication of all innocuous animals, birds, fishes, insects and vegetables, whether useful or ornamental.
2. The perfection, propagation, and *hybridisation* of races newly introduced or already domesticated.
3. The spread of indigenous animals, &c., from parts of the United Kingdom where they are already known, to other localities where they are not known.
4. The procurement, whether by purchase, gift, or exchange, of animals, &c., from British and foreign countries.
5. The transmission of animals, &c., from England to her Colonies and foreign parts, in exchange for others sent thence to the society.
6. The holding of periodical meetings, and the publication of reports and transactions for the purpose of spreading knowledge of acclimatization, and inquiry into the causes of success or failure.

The society will begin with small and carefully conducted experiments.

It is proposed that those members who happen to have facilities on their estates for experiments, and who are willing to aid the objects of the society, should undertake the charge of such subjects for experiments as may be offered to them by the society, periodically reporting progress to the council.

It will be the endeavour of the society to attempt to acclimatise and cultivate those animals, birds, &c., which will be useful and suitable to the park, the moorland, the plain, the woodland, the farm, the poultry-yard, as well as those which will increase the resources of our sea-shores, rivers, ponds, and gardens.

It is hoped that this endeavour to increase the internal resources of the country will meet with the support of the public.

Persons desirous of becoming members may do so on subscribing £2 2s. per annum. A donation of £10 will make the donor a life-member of the society.*

The Society thus formed have had several meetings, and discussed several points; they have obtained promises of support and co-operation from many persons who are interested in the subject. Among others who attended the meetings was Mr. Edward Wilson, whose name is so well known in connection with the operations and successful efforts he has so nobly made to acclimatise animals in Australia. This gentleman addressed a most powerful letter to the *Times*, (which I regret I have not space to print in full,) whereby he raised the public mind to the importance of acclimatization, and did an essential service.

Shortly after this letter appeared in the *Times*, at a meeting held October 6, 1860, Mr. Wilson announced publicly that Miss Burdett Coutts, with that generosity and kindness of heart which has gained for her the respect and esteem of all classes, both rich and poor, had presented the Society with the munificent donation of £500, together with a promise of subscription of £10 annually for five years. Thus did this excellent lady stretch out the hand of encouragement towards those who were endeavouring to do good in their generation, and we may now state that "The Society for the Acclimatization of Animals" is fairly on foot, and the Council are willing to undertake such steps as shall be most advisable, in opening the active operations in a field new and unexplored. We are as yet young, and amid the *embarras des richesses* we feel it difficult to know how to begin.

In his letter to the *Times*, Mr. Wilson stated that a great want in this country was a domestic animal not too

of Good Hope a quantity of carp and tench, that he delivered 75 per cent of them alive, and that they have since multiplied amazingly. He is about to send out some trout to the Cape.

* Temporary Offices, 346, Strand.

large to be consumed by a middle-class family, and the flesh of which should be meaty rather than poultry like. Our sheep are too large for this purpose; pork is not wholesome if used too frequently or killed too young; and rabbits are too small, flavourless, and white-meated.

For the new animal the wombat was suggested, a rodent which burrows in the earth, feeds by night, and has flesh which affords excellent eating. It abounds in districts of Australia.

Here, then, is an animal which might be tried, but I fear there would be some difficulty in getting it generally adopted as an article of food, for prejudice would be in the way.

It remained, therefore, for us to cast about and see what sheep we could find which would come up to the necessary requirements. I shortly afterwards received a letter from Dr. Gardner, mentioning a sheep which would answer the purpose, viz., the Purick sheep, which is found in the districts of the Himalaya. Long correspondence ensued about this sheep, as well as other small kinds of sheep, which were to be procured in different parts of the world. At length I heard of a small sheep which had been imported from Brittany by Mr. Baker, of the Pheasantry, Beaufort-street, Chelsea. Whether this be the Purick sheep of Dr. Gardner or not I am not aware; anyhow, I show it alive this evening, that persons may judge for themselves of the advisability of endeavouring to make this sheep, or a sheep like it in size, &c., general in this country. It is certainly a very little beast to begin our acclimatising efforts with, but I look at it in the light of the proverbial "small end of the wedge." The habits of this animal are exceedingly hardy; it lives in a wild, barren place, and I should suggest its adoption by persons who have a lawn or grass plat, or still better by cottagers, who could turn it out to live on the grass which grows about our hedges and ditches, and which is often wasted by not being grazed down.*

The second point the Society intend to commence with is—the introduction of game birds. The Hon. Grantley Berkeley, in his wanderings on the prairies of America, was much struck with the advisability of endeavouring to acclimatise in this country the prairie grouse and the tree grouse of America (of which I now show specimens, and relative to which I have much information). This gentleman became acquainted with several persons who are willing to aid him by sending over these birds, and also some specimens of American deer. Captain Hardy, of the Royal Artillery, has kindly promised to send us over from Halifax, where he is now quartered, not only living grouse but also their eggs, relative to the transport of which for long distances I have again many valuable hints from practical men.

Thus we have endeavoured to select, as opportunity afforded us (for we are not yet rich enough to choose), a specimen of a beast and a bird. It only remains now to find a fish which shall take the place and become a useful pond fish, and we have, I believe, found a fish, the "Lucid Perca" or the "Sander" (of which I show a drawing the natural size). From all evidence we have received, this appears to be the fish we wanted. We want to get him over here, and I am in the track to do so by means of an apparatus kindly lent us by Mr. Wilson; and when he arrives here, I know a gentleman who has kindly offered to receive him and treat him with all the deference due to such a distinguished (and we trust also useful) foreigner.

One of our objects, as you see from the programme, is to collect information. All information is valuable, for it prevents action in false directions, and suggests plans.

* As regards sheep, I would also mention that we intend to pay attention to animals which are likely to effect improvements in wool, but as the subject has been so admirably treated by Professor Owen in his lecture on the raw materials from the animal kingdom, in the Great Exhibition, given in this theatre December 10, 1851, and also by Mr. Leonard Wray, in the *Journal of the Society of Arts*, Vol. VIII., No. 377, Feb. 10, 1860, it would be presumption in me to touch upon the subject.

We have been fortunate enough to receive correspondence from many parts of the world, and not only correspondence but actual co-operation, for, in September last, the Society sent, by invitation, a deputation to Glasgow. A meeting was held, the Lord Provost in the chair, the result being, that there has been formed by the enlightened citizens of this noble town, a Scottish branch of the London Acclimatisation Society; and thanks to them for their cordial reception and assistance.

I wish, in this place, to state publicly, once for all, that the Society just formed is by no means desirous to run counter, or be set up in opposition to, the Zoological Society of London. The Council, on the contrary, trust that they shall obtain their co-operation and support, inasmuch as the point aimed at by them will be to carry out measures in full which are not insisted upon by that highly scientific body of men.

Again, I feel convinced that, as time goes on, the Government of this country will be convinced of the national importance of Acclimatisation. But lately the subject of the systematic interchange of the natural productions of the British dependencies was brought under the notice of the Colonial Office by the Earl of Carnarvon, and his Grace the Duke of Newcastle replied that it had been in his power to render some service to the cause by writing to the governors of several of our colonies, but that anything like a vote of public money was inexpedient.* In his letter to the *Times*, Mr. Wilson asks:—"Is your Government right, while surrounded by fifty-five colonies of unknown capacities, to leave everything to private enterprise; and, if private enterprise fails, to allow the noblest undertakings to rest, comparatively untested by any effort whatever." Let us do our best, and rely that the Government will, sooner or later, recognise our exertions, and help us in our endeavours for the public good.

I have now performed my task (inadequately, I fear), of putting before this Society some few facts relative to the Acclimatisation of animals, and I trust that I have succeeded in making it appear that this is a subject the details of which are not only highly interesting, but can be carried out with the prospect of great and most important results. Much, nevertheless, will depend upon individual exertion and support, and I here beg to appeal to all those who can (and there are many who have the opportunities) to help us as much as they can. Mr. Mitchell, with an encouraging tone, writes:—"If a hundred of our great proprietors would each give up the necessary space and money to cultivate one single species, no matter of how great or how little importance, the result in twenty years would infinitely surpass all that could ever have been done by so miscellaneous and comparatively unmanageable assemblage as that marvellous collection of Lord Derby's, of which we speak with affection and regret."

Again, a writer in the *Saturday Review*, April 14, 1860, most justly says:—"When we consider the enormous influence produced upon the history of mankind by the sheep, the horse, the dog, and others of our domesticated animals—formerly, without doubt, existing in a state of nature, and reclaimed from it by the agency of man—who can deny that results, if not equally great, yet of the utmost importance to the human race, may follow from additions yet to be made to the list? It would be strange indeed if, out of the numerous species now known to science to choose from, and with all the experience of modern civilization, we were altogether to fail in selecting some with constitutions sufficiently pliable to be moulded into races subservient to the use and profit of mankind. It is true that the importance of the animals recently added to our domestic stock is not great, and their number insignificant. But this, perhaps, is as much attributable to the little attention that has been paid to the subject as to any supposed exhaustion of the series of 'acclimatizable' animals."

I do not wish it for a moment to be supposed that I

* See Mr. Wilson's letter to the *Times*, for Sept. 22nd, 1860.

am sanguine or enthusiastic enough to imagine that a quarter or even a third of the animals, &c., will ever be acclimatized or made useful in this country, or, that the Society established for this purpose will be able to make a very large gap in the 140,000 animals mentioned in M. Geoffroy Saint Hilaire's list, but as I have to treat on a subject as a whole, I should be failing in my duty if, to a large and highly educated audience, I did not endeavour to lift up the veil which secures that great panorama with which we are everywhere surrounded, to point out with the rod of experience those living creatures which actual experiment had positively proved and demonstrated could live and multiply their species in our own favoured land, or to suggest several foreign creatures that might, and would most probably live, if conditions were made by the hand of man suitable to their welfare.

My object has been to show what a wide field is now open for public as well as individual exertions, and how much is left unheeded which ought to be cared for. I have cast my bread upon the waters, in hopes that time will lead to the most important national results, and that we may live, one and all of us, to carry out as far as in us lies, that great command which was given to our first parents, and from them to ourselves, by the great Creator himself, to have "dominion over the fish of the sea and over the fowl of the air, and over every living thing that moveth upon the earth."

DISCUSSION.

The CHAIRMAN said it was now his duty to invite discussion upon the very comprehensive and highly interesting paper they had heard from his young scientific friend, the son of his oldest and best scientific friend. He should be happy to hear any remarks which would tend to the better ventilation of this great and useful subject, which in his opinion constituted one of the most practical parts of natural history.

Mr. Chief Justice TEMPLE, having expressed the pleasure with which he had listened to the paper, said Mr. Buckland had, by the amusing manner in which he had treated the extensive subject now brought under their notice, sweetened the edges of the chalice of instruction, and had presented knowledge to them in its most delightful garb. The acclimatisation of animals and vegetables was a subject of the highest importance, and the establishment in this country of a society with that object in view was entitled to every support and encouragement. Without acclimatisation what would Great Britain be at the present moment? How meagre would be the necessities, and how absolutely *nil* would be the luxuries of life! It was true that, without the aid of such a society, the natural as well as the adventitious wants of man would always prompt individual efforts to introduce into this country animals and vegetables indigenous to other countries, and to naturalise them here. Much had been already done. There was little doubt that our ancestors, though they had beasts of the chase—the wild bear, the fox, the wolf, and probably the deer also—yet had very few of those animals which at present administer to our daily wants. The field, however, notwithstanding great individual exertions, was still very wide; there was yet a great deal more to be done, and they must look to an acclimatisation society to aid individual efforts to enhance the comforts and increase the happiness of man. If they looked abroad in the world, not only in this country did they find animals which centuries ago had no existence here, but in other countries also there were animals in great abundance, which, when these countries were first discovered, had no existence there. There were at present no doubt hundreds and thousands of animals which might, he thought, be very easily introduced into this country and naturalised. Some of them perhaps might not entirely succeed, but he thought it was incumbent upon a society such as Mr. Buckland had alluded to, to try the experiment. If in one case the

experiment failed let them try others, and there could be no doubt that in the end they would succeed in introducing a great number of animals which would add greatly to the pleasures of the table and to the comforts of life. In introducing any new animal into this country, of the qualities and characteristics of which they were ignorant, they would doubtless encounter considerable prejudice. If they placed a new dish on the table the company would look at it with suspicion, and it would perhaps be rejected without having been tasted; but he thought in such a case as that the Attorney-General would be justified in doing as he had done in a recent well-known instance, applying to the Court of Queen's Bench for a writ *ad melius inquirendum*, and, notwithstanding it might be pleaded that the inquiry had taken place *super visum corporis*, the application would no doubt be granted, because the body had been viewed without having been tasted. There was a little animal which they frequently saw in Museums, and in the Gardens of the Zoological Society, called the armadillo, well-known in the country where he had held an official position for many years, British Honduras. Were he to recommend the eating of this animal to an epicure, probably from the bad company he had seen it in, he would feel disgusted; but if he placed it before him well roasted, well stuffed, and accompanied by a savoury gravy, he had no doubt it would be pronounced a most estimable dish. This animal burrowed in the earth, and fed upon roots and other vegetable products. It was most cleanly in its habits, and in that country it was esteemed one of the greatest delicacies of the table. He had frequently eaten it. Its flesh was perfectly white, delicate, and juicy; and he was certain, if introduced here, it would be considered a great delicacy. There were also in that country other burrowing animals which were very delicious. In alluding to many of the specimens which Mr. Buckland had introduced to their notice, that gentleman had laid some stress upon their being good eating. He was quite right in doing so, because there was no doubt that the value of animals was, after all, not so much on account of their beauty as their capability of adding to the comforts and pleasures of life. He was sure, from the highly successful experiment that had been tried with the eland, they ought to be stimulated to further efforts to introduce into this country other animals of a similar kind. The flesh of the gibbonet was white and delicate, and did not differ much from that of the armadillo. It was a very singular fact that the flesh of almost all animals found in tropical climates was white; perhaps the learned professor in the chair would be able to give them some information to account for that circumstance. Another animal found in Honduras, which he believed might be successfully introduced into this country, was the Indian rabbit. It however bore no resemblance to the rabbit except in its habits. Its mode of eating was very different. The flesh of that animal was also perfectly white, short-eating, and delicate, but it was not fat. In fact an extraordinary peculiarity of the animals found in tropical climates was an absence of all fat, and he could account for it in no other way than attributing it to the constant annoyance to which such animals were exposed in those climates from the musquitoes, red ants, and other insects to whose attacks they were incessantly subjected. A great deal had been said and much information given respecting the varieties of the deer tribe, and they had heard a charming description of the wapiti. In Honduras there were two kinds of deer. The red deer, which was almost as large as the red deer of Scotland, but the flavour was very different. He had not tasted the red deer of Scotland, but he had been told it was dry and stringy. The red deer of Honduras was rather dry eating, but was not stringy, but short, like most of the game in that country. There was also the fawn-coloured deer, a very beautiful animal, the flesh of which was also perfectly white. The antelope also abounded in Honduras. It was a small but very beautiful

animal, which he thought could easily be introduced into this country. It would not only be a valuable addition to our table delicacies, but also an ornament to our parks. Of birds there was a large variety in Honduras. That which was first deserving of notice was the curassow, two specimens of which were exhibited. These birds, when cooked, were of similar flavour to the moor-cock of Scotland, and there was upon the breast a layer of white and a layer of brown flesh. There was also the guan, which he had brought from Honduras. He saw no reason why both those birds should not be naturalised in this country. They mixed well with the other poultry in the yards, and were easily domesticated, and in Holland he had been told they had reproduced. The Honduras pheasant was another bird which he believed might be successfully introduced. It, however, bore no resemblance to the pheasant of this country, in size, plumage, or flavour; but it was capable of being easily domesticated, and he thought there would not be the least difficulty in naturalising it. There were many varieties of pigeons in Honduras. One species—the mountain pigeon—was a large bird, with a beautiful purple and golden plumage. The flavour was similar to that of the common partridge; but how far the flavour would be altered upon the introduction of those birds into this country he could not say, or whether the flavour depended upon the character of the food they ate. Mr. Temple then called attention to specimens which he exhibited of the black-boned fowl, respecting which some controversy had taken place. Those birds, he said, he had succeeded in completely domesticating on his own premises at Honduras, and those which he had brought over to this country and given to the Zoological Gardens had brought up several broods of young. He believed, if these were killed, their bones would be found to be black like those reared in Honduras; but he could not say to what depth into the bone that colour penetrated, or whether it was more than a covering to the exterior of the bone. Mr. Temple concluded by expressing a hope that, at some future time, he might be able to give some aid to so valuable an institution as the Acclimatisation Society, to which he wished every success.

The CHAIRMAN said Mr. Buckland had evidently obtained a most valuable recruit in the last speaker. Respecting the important subject of the propagation of salmon in other countries—particularly its transport to such of our colonies as had rivers suitable—he regretted that Dr. Milligan did not appear to be present, or he would have asked him to give them some information on that subject.

Dr. CRISP thought they had to look to the really useful and practical part of the question. It resolved itself into the ornamental and the useful. All the animals mentioned by Mr. Buckland were for the delectation of the higher classes. What he wished to look to was the introduction of animals which would be useful to the community at large. They had an increasing population, and the extensive plains and commons which those animals would inhabit were gradually disappearing, and were being appropriated to agricultural purposes; therefore it was useless to think of introducing these large animals to be kept in their wild state. He should very much like to see some of the animals spoken of ranging in parks and meadows, but he questioned whether anyone present would venture to intrude his person where there was a herd of elands at liberty. With regard to that animal if he had struck him that the horns might be removed when the animal was young, and it might be used for agricultural purposes. There was one matter connected with the subject which ought to be borne in mind; that was, in studying the physical structure of animals, he had noticed that the Almighty had placed them in localities and climates suited to their conformation. If they wanted an illustration of that, let them look at the Suffolk breed of cart-horses, which if taken to Scotland, in a few years degenerated. Numerous instances of the same kind might be adduced with regard to sheep, so that even in our own li-

mited country they found that certain breeds of animals thrived best in particular localities, and if taken to other localities they degenerated. Then what had already been the experience with regard to the introduction of foreign beasts and birds? There were sportsmen present who he believed would give their opinion that it would have been well if the French partridge had never been introduced into this country. A number of those birds were placed upon the estate of the Marquis of Hertford, in Suffolk, about 40 years ago, and they were to be found in nine or ten other counties; but he believed the opinion of sportsmen to be that they destroyed the grey partridge, spoiled the dogs, and were generally disliked as objects of sport. Then came the question with regard to the curassow. That bird was originally introduced upon the same estate, but they all died from various causes, and the same was the case with regard to the golden pheasant; so that although he agreed with Mr. Buckland as to the great importance of the subject, and although he believed the Acclimatisation Society was likely to be of immense benefit, yet he thought they must look at this matter in a more practical and utilitarian point of view, and they must not be too sanguine as to the results.

Mr. McKINNON said he should be wanting in his duty, in the absence of Dr. Milligan, not to give such particulars as he possessed with regard to the introduction of salmon into Australia. He had acted as hon. secretary to the Australian Association of London, which had been formed for the purpose of considering questions of interest to that colony. In the first attempt that was made to introduce the salmon into Australia the expense was borne by private individuals interested in the colony, and the enterprise was entrusted to Capt. Black, who was requested, by the Government of Tasmania, to investigate the rivers and report upon their suitability for salmon. The report of Captain Black was so favourable to the project that a committee of the colonial legislature was appointed for the purpose of inquiring into the subject, when they reported, as their opinion, that the Colonial Government should place a sufficient sum of money at the disposal of the Australian Association in London for the purpose of making experiments upon this matter; and by the last mail he (Mr. McKinnon) received the intelligence that a sum of £1,725 had been placed at the disposal of the association for that purpose. Upon the receipt of that communication a meeting of the association was held, at which the subject was discussed; but they felt, in the absence of Dr. Milligan and other gentlemen, that none of the members had sufficient experience and knowledge of the subject to justify them in entering upon the experiments, and they decided to suspend the operations until the winter of 1861-2; and they solicited the assistance of practical men to enable them to enter upon their labours next year with a better hope of carrying out the project to a successful issue. Mr. Lloyd had been requested to collect all the information he was able to do, and he hoped many other gentlemen would feel sufficiently interested in the subject, and would give the association the benefit of their knowledge and experience. It was his intention to propose a premium for an essay on the subject. It was well understood that nothing was easier than the rearing of salmon from ova when once on shore; but the difficulty was the sending the ova in ships, which were tossed about and passed through such variable temperatures. These were matters which had to be looked into and provided against before any fresh experiments were entered upon.

The CHAIRMAN was happy to see that they were favoured with the presence of Mr. Crawford, the late governor of Singapore, a country to which we were indebted for many beautiful animals now in England. He should be glad to hear any observations from that gentleman.

Mr. CRAWFORD, responding to the call, said he was compelled to differ to a considerable degree from some of the premises laid down by his friend Mr. Buckland. He begged

to say that the number capable of being domesticated, both of the feathered tribes and mammalia, was very small. There were nine species of the horse family, and they had never succeeded in domesticating more than two of them, viz., the ass and the common horse. There were, he believed, 300 species of pigeon, and there was but one which had ever been domesticated, and that was the common blue rock pigeon, which existed in every part of the world he had been in. With respect to the deer and the antelope, he had eaten the flesh of both those animals, and he assured them the Indian deer was very bad food. He had never eaten good venison out of England—not even in his own country—Scotland. The fallow-deer beat all the others. The red-deer was very high-flavoured, but it was never fat, and they were obliged to add the fat of mutton to it to make it tolerable at table. Besides that, where was the room for all these animals if they could domesticate them? The deer of this country were kept as luxuries, and were only to be seen in the parks of gentlemen, from whence only they found their way into the market, and were sold at a very high price. Something had been said about the alpaca. He understood Mr. Buckland to say that that animal was not suitable for this country, though it was for Australia. He (Mr. Crawford) was of a different opinion. The alpaca was a native of high mountains, and there were no high mountains in Australia, at least they were not more than one-fourth the height of the Himalayas. The alpaca was, by the anatomical structure of its foot, fit for high mountains, and nothing else. It was but a poor beast of burden, and not at all a beast of draught. It was true the wool was of double the value of common sheep's wool, and they had from three to four millions of pounds annually imported from Peru. He found that the camel had been introduced into Australia. Now, the camel was eminently a beast for desert and barbarous countries; no country having good roads would have camels, and they could never succeed in Australia as a domestic animal. In such a country, the donkey was a more useful animal than the camel. Four donkeys would carry the same burden as a camel, and a donkey would live without water as long as a camel. The camel was a delicate animal in its constitution, and as many as 20,000 of those animals perished in the Affghan war. With regard to the introduction of salmon into Australia, he had a strong impression that it would never succeed. Did any one ever hear of salmon in the southern hemisphere, or within the latitude of 40 degrees? Far north, they were very abundant. It was a creature of a cold climate, or at all events of a temperate one, and was nowhere to be found in the tropics. Australia was in latitude from 30 to 40 degrees. There was no salmon in the Mediterranean, although they might have expected to find it there; and if it did not exist there, how could it be propagated in Australia?

Mr. Boccius agreed with Mr. McKinnon, that salmon might be successfully introduced into Tasmania in rivers whose waters were chiefly supplied from the mountain streams, but the main point was the safe conveyance of the ova to that country. In 1852 Earl Grey, then Secretary of State for the Colonies, directed him to give his attention to the sending of salmon over to Australia. He obtained the spawn, but, unfortunately, the vessel by which it was sent was detained thirty days in London after it was taken on board, and afterwards lay for seven days in the Downs, so that the salmon were bred out on this side of the equator. If that detention of the vessel had not occurred, the fish would have been bred on the other side of the line, and in that case he believed they could have been carried to Tasmania. He would further remark that, notwithstanding the rivers of the east and south-western parts of this country had become comparatively barren of salmon through the large extent of fishing, yet by proper protection of the spawn, any stream in this kingdom could be restocked in the short space of two years. A salmon of 10 or 15lbs. weight was capable of reproducing 15,000 fish;

within two years these fish would be capable of reproducing to the like extent; and if due protection was given to the fisheries, what an enormous quantity of food could be obtained from our rivers! With regard to the management of fish ponds, he had published a treatise upon that subject, from experience he had gained in Germany. There was not a stream of water in this country which was not adapted for the propagation of salmon. Tidal streams were the best, for the salmon went to the estuary to feed; and after 15 months old the salmon never fed when they returned to the natural waters in which they were bred. The consequence was they might breed these fish to an unlimited extent, and they did not in any way interfere with the stock of the other description of fish in the river.

Mr. TEGETMEIER, being called upon by the Chairman, mentioned that the Ligurian bee, spoken of by Mr. Buckland, had attracted considerable attention amongst the German apiarians, and it had been successfully introduced into that country. It was distinguished from the ordinary bee of this country by the yellow rings round its body, which were black in the common species. It was regarded as superior to the common bee, and collected food in more unfavourable weather, besides being harder and less irascible, and the queens were more prolific than those of the common bee. These were deemed to be advantages. They had been joined on to the stock of common bees, and were now working very successfully. The species had been disseminated by the artificial rearing of queens. In addition to their value in an economic point of view, there was considerable interest in the subject scientifically, inasmuch as the colour of the two distinct species would enable scientific experimenters to investigate, under advantageous circumstances, the question of parthenogenesis and other obscure points in the natural history of the bee.

Mr. LEDGER attributed to the fact of his being the brother of the first importer of alpaca into Australia the honour of an invitation to attend that meeting. He had derived both amusement and instruction from the able paper with which Mr. Buckland had favoured them, and he should not have taken part in the discussion except that he wished to correct an impression that might be entertained from the observations of a previous speaker, Mr. Crawford, that the alpaca would not thrive in Australia. He had made a collection of extracts from the newspapers of the colony, from which he was able to say that the anticipations of Mr. Crawford were entirely unfounded. The alpaca had been introduced into Australia for nearly two years. They had greatly multiplied there. They had increased to the second and third generations in the crosses which his brother had established in South Australia. The *Sydney Morning Herald*, of the 18th October last, contained an article on the subject of the alpacas in Australia, which stated as follows:—

"The flock of alpacas and llamas introduced eighteen months ago by Mr. Ledger are still under his charge, depasturing at Arthursleigh, a sheep station a few miles off the Southern-road. Since they have been there they have thriven surprisingly, and have by successful lambings repaired the losses that were sustained a year ago, at Liverpool, principally through want of fodder. On their landing, in December, 1858, the flock numbered 256; when sold to the government in the following April, it had increased to 291. The deaths last winter reduced the flock so that on arriving at Arthursleigh they only numbered 253; they now amount to about 300. Although very late in the season the lambing is not yet finished; some have been dropped within the last few days, and are doing well. Excepting three, all the lambs born at Arthursleigh have been preserved. The animals are found to attain maturity here earlier than in South America, several instances having occurred of ewes under two years breeding lambs. The course of breeding has already arrived at the fourth cross, and the appearance of the animals, as the breeding progresses, encourages Mr. Ledger to expect ultimately to produce a finer animal than the alpaca of Peru. The experiments of the naturalisation of the alpaca in Australia has been so fully and successfully carried

out, that the alpaca may now be looked upon as an Australian animal."

From that statement no doubt could exist as to the perfect acclimatisation of the alpaca in Australia. It had been remarked by one speaker that this paper would have been more valuable if it had been directed to more practical results; but they must appeal to the useful through the ornamental. He agreed, however, that the acclimatisation Society should commend itself to their attention in the first instance by adding something which was of great general utility. If they wanted encouragement from the past they would find instances in the turkey and the potatoe; and he could show them from figures what had been the commercial effect of introducing a new animal into our Australian colonies. It frequently occurred that when animals were transported from the sphere of their original existence they had become better animals than when they were in their wild state. In 1778 the population of the town of Sydney was 1,030, and its stock consisted of one bull, four cows, one stallion, three mares, and three colts. In the year 1800 the first wool was exported from Sydney, amounting to 658 bales. In 1807, Mr. McArthur exported 245lbs of sheep's wool, the first produce of his flock of merinos. In 1858, the quantity of wool imported into this country from Australia was 51,104,560lbs. Might not the alpaca be equally productive? From every account that had been received it seemed probable it would be so. His brother, Mr. Charles Ledger, estimated the home consumption of llama wool, in Peru and Bolivia, at 16,000,000lbs.; and the alpaca being found to be the more valuable commodity for the foreign market, it was more largely exported, whilst a greater quantity of llama wool, which was of much less value, was retained for home consumption. In 1834, the export of alpaca wool from South Australia amounted to 5,700lbs.; in 1838, to 459,000lbs.; and in 1842, to 1,458,000 lbs. Then came an epoch in the history of the alpaca. Mr. Titus Salt, in 1845-6 discovered the means of utilising the wool of the alpaca by an admixture of it with cotton in the warp; and in 1848 the quantity of this wool utilised by Mr. Salt was 1,521,370lbs; in 1853, 2,148,276lbs.; in 1856, 2,800,000lbs; and in 1857, 3,000,000lbs. The average production of wool of a sheep in Sydney and Moreton Bay was 2½lbs. per fleece. In Victoria and Tasmania the average weight per fleece was 4 lbs., whilst the average of alpaca fleece was 7 lbs., and he might state that one sheep, shorn at the age of fifteen months, yielded a fleece of 12 lbs. weight, and another of 17 lbs. weight. He thought it was unnecessary to say more upon this subject, and he trusted he had said enough to satisfy Mr. Crawford that he was wrong in his anticipations that the alpaca would not thrive in Australia. The letters which he received from his brother from time to time abounded in expressions of the success which had attended the introduction of his flock of alpacas. He had been sent by the Government upon an exploration for a locality suitable for the flock, and having lighted upon Arthursleigh, he at once fixed upon that as the locality suitable for their habitat; and such a report was sent to the Government that they decided that it was unnecessary to go further, but that there the experiment, which had since turned out so successful, should be tried. It had been said that the man who caused two blades of grass to grow where one grew before was a benefactor to his species. Might not the same be said of the man who caused two food or clothing producing animals to thrive and prosper where one only came to maturity before? and if so, was not equal or even more gratitude due to him who caused animals useful to man to thrive where none had thriven before?

The CHAIRMAN said in the position in which he had the honour to be placed that evening, a few remarks from him might be expected. He would first mention that the Zoological Society of London had originally been founded in this country by Sir Humphrey Davy and other men of

science, for promoting, amongst other objects, the very useful purpose of the acclimatisation of animals. That society had its gardens in the neighbourhood of London, whilst the farm for carrying out the experiments of acclimatisation was at Kingston. In that instance, however, the society did not appear to have been successful, and they ultimately gave up the farm, without having succeeded in introducing a single new live animal. They had at one time a good flock of kangaroos, but they did not succeed in domesticating them. What his friend Mr. Buckland said was true, that this was a subject which deserved every attention. It might be asked why they had not done more? He supposed in this country he might say they were for the most part too busy—too much occupied; but that was not the case with all, and happily those who had the leisure had also the best material means of promoting this object. They were the possessors of parks and rivers, and lands and mountains, and it was to them that he looked more particularly for success, far more indeed than to the labours of their excellent French neighbours in this direction. It was to individual noblemen and gentlemen, in a country like England, that they must look for success in carrying out these measures, and hence an Acclimatisation Society in this country would be most successful, as being a centre for giving and obtaining information, and promoting the views of private individuals, and forming also a central body for turning to account the materials and information obtained. It was under these circumstances they had succeeded, as far as they had yet gone, in the introduction of the eland, which formed an almost exact transition between the deer and the bovine tribe; and he thought with that animal they were likely to have the same success as they had had with the fallow deer. The eland might be naturalized by the same means, and it required no more artificial protection than the fallow deer, which itself was not originally a native of our island. They could not trace the fallow deer in this country further than about 700 years back; certainly he could say that the fallow deer, the red deer, the roebuck, and the reindeer were not the aboriginal deer of this country. The three latter were known as far back as the time when the elephant, the rhinoceros, and the smaller species of the bovine animals were in existence, and also the huge *cervus megaloceros*, or fossil elk, which had passed away, and which far surpassed in size anything with which they were acquainted in the present age. Reference had been made to the hunting excursion of Prince Alfred in South Africa, and some regret was expressed that his Royal Highness did not endeavour to import some of those wild animals alive into this country which he had killed in hunting. Now, a midshipman could have but very little room in a ship to be devoted to such purposes; but he could tell them that his Royal Highness had promoted the progress of science by collecting some of the most perfect fossil remains of South Africa which had ever reached England, and these he had sent to him (the chairman), accompanied by a note, characteristic alike of his Royal Highness's intelligence and urbanity. With reference to the alpaca, although for the most part it was a native of the mountainous parts of South America, yet it was not entirely confined to those districts. There were varieties, not specifically distinct from the mountain llama, which found their food on the plains of New Patagonia, and in such situations the conformation of the hoof became more adapted to the less rugged locality which they inhabited; and in process of time that might be the case with the hoof of the alpaca of Australia. Time would not admit of his saying all he wished with respect to the beaver, or the excellence of the meat of the elk. His friend, Mr. Justice Haliburton, had sent him a portion of the latter animal which he had invited Mr. Buckland to partake of, and which was excellent. With regard to another topic—the attempt to introduce new species of birds into this country, it was true, as Dr. Crisp had said, that the introduction of the French part-

ridge might have produced some unpleasant results, in the same way as a certain water-weed which had of late years been introduced into our streams; but if in one instance there had been a failure, he apprehended it would be but a small exception to the general results, and that it ought not to weigh against using their utmost energy in attempting to introduce what might be of great benefit. He had been asked to account for the physiological phenomenon of the almost invariable whiteness of the flesh of tropical animals. He confessed he was not able to trace any connection between this and the heat of the climate. Quadrupeds of the same order as to the structure of the brain which were met with in colder latitudes, had the same pallid white appearance in the flesh, and, therefore, this was not due to the heat of the climate. Moreover, the flesh of the llama and alpaca found in the warm parts of South America was of a dark colour. He would state, with reference to the introduction of the pond fish of this country into the Cape of Good Hope, that that idea originated with the excellent Governor of that colony, Sir George Grey. It was seconded by Mr. Edward Layard, curator of the museum at the Cape, who wrote to him (the Chairman) upon the subject; and after communication with Mr. Alfred Lloyd, as to the making of suitable aquaria for their transmission, he obtained the permission of the Duke of Cambridge to take what pond fish, tench, carp, &c., he required from the waters in Richmond-park, in order to their being sent to the Cape. These specimens, having been taken at the age deemed most favourable for their transport, were forwarded to the Cape under the superintendence of Captain Clarke, who was quite successful in carrying them to their destination; and the fish so transported and reproduced were esteemed an excellent addition to the table, so that in time they would be as much prized in the colony as they were by the monks of old, who first introduced them into this country from the Continent. He believed that practically the establishment of a Society for promoting the Acclimatisation of Animals would form a central machinery for stimulating individuals having conveniences for these experiments, and might be the means of furnishing the specimens in the first instance. This matter had been carried on with great diligence by the Imperial Society of Acclimatisation in France; and with regard to another association formed at some distance from Paris, he (the Chairman) had taken shares, in order to evince the interest which English naturalists took in the matter; and from the reports he had received from the directors they expected much success, and were setting an admirable example, which he hoped would be followed in this country. He had now only to propose a cordial vote of thanks to Mr. Buckland for his very excellent paper.

The vote of thanks was then passed.

The Paper was illustrated by a large number of stuffed animals and skins, kindly lent by Mr. Leadbeater, of Brewer-street; Mr. Bartlett, of the Zoological Gardens; Mr. Roberts, of Princes-street; Mr. Gould; Mr. Lewis Fraser; and the proprietors of the *Field* newspaper; as well as by drawings, lent by Mr. Sclater, of the Zoological Gardens; and pearls from the Tay, lent by Mrs. MacGregor, of Perth.* Mr. Baker, of the Pheasantries, Chelsea, exhibited a living specimen of a small sheep; and Mr. Chief Justice Temple contributed some living specimens of kurassows and guans, and black-boned fowls from British Honduras.

* See a paper by D. J. Macgowan, M.D., "On Pearl and Pearl-fishing in China," communicated by Sir John Bowring, LL.D., H.B.M. Plenipotentiary in China, *Journal of the Society of Arts*, vol. ii., p. 172.—Ed. S. of A. J.

The Secretary announced that on Wednesday evening next, the 5th December, a paper by Mr. H. G. Collins, "On Electro-Block Printing, especially as applied to Enlarging or Reducing from any Printing Surface or Original Drawing," would be read.

The following letter has been received by the Secretary:—

SIR,—Amongst the uses of the acclimatization of animals will not be forgotten the purposes of food, vegetarians notwithstanding.

There is such a thing as the acclimatization of animals after death as well as before, *i.e.*, the question of preserving flesh-food from decay, whatever length of time it may have been kept. At present our arrangements are very imperfect. If dead meat be hung in a current of forced dry air, it is doubtful if it would ever putrefy. It might be dried up in this mode, and become jerked beef or mutton, but would still remain good food. Putrefaction will not take place without the three conditions—moisture, warmth, and stillness. Frozen meat remains unputrefied for any length of time, but by freezing it loses its flavour, and how to restore this flavour is one of the points demanding the attention of the chemists.

The City authorities now and then seize upon and condemn putrid flesh and fish as unfitted for human food. What becomes of this we do not know, but there is little doubt that it would be good food if properly treated. Applying charcoal to absorb the putridity, and otherwise chemically treating it, would probably leave it in as good condition as when first killed. It is worth while to ascertain this, and if it can be publicly made known that it can be restored to the condition of food wholesome for man, it would cease to be dealt with in surreptitious methods, made into sausages, with the poison left in, and so on, and cease to be wasted when ordered to be destroyed. There is no apparent reason why even diseased meat should not be converted into good food, by curing the disease after death as well as before. What we in England call carrion is assuredly eaten in other countries, and possibly many modes of cooking may render it wholesome. It certainly seems at first sight a simpler process to convert dead horse into a ragout than a lady's slipper; and the boiled leather breeches of the Irishman in Lover's tale, if boiled till tender, might, after all, be better tripe than that of a sheep. We might be better employed in England in converting bad fish into good food than the Prussians are in persuading other Prussians to eat dead horse, which, by the bye, is as good as venison if young and tender and properly kept, the chief disadvantage being that it is too dear till it comes to the knackers, of whom, the story goes, a Frenchman purchased his commodity, under the idea that it was good beef. We have not yet got to the end of our food chemistry, and it is well, from time to time, to give those sluggish gentlemen, the chemists, a jog. Perhaps the next move of James Young may be to convert his paraffin oil into fresh butter. The coal pit would prove a splendid cow, if we could turn it to this use. I am, &c.,

COSMOS.

Home Correspondence.

EFFECTS OF TEA AND COFFEE.

SIR,—I observe a letter in the Society's *Journal* of the 16th, calling in question certain remarks made by me, on the subject of the action of theine and caffeine on the system. I would not trespass by asking space in your *Journal*, except that my silence may be construed into assenting to the views therein expressed. As many of

your numerous readers may feel interested in the subject, I would refer them to Johnson's "Chemistry of Common Life" and Lewis's equally admirable "Physiology of Common Life." I am, &c.,

JAMES A. MANN.

Proceedings of Institutions.

GOSPORT AND ALVERSTOKE LITERARY AND SCIENTIFIC INSTITUTION.—The tenth annual report of the committee of this Institution states that the transactions of the past year have been of a very favourable and cheering nature, and afford substantial grounds for hope and encouragement for the future. The number of members at present on the books amounts to 193, being an increase of 28 since the presentation of the last report, and the Committee have reason to believe that that number will be increased, as they are enabled to offer additional advantages. The income of the Institution has been £152 12s. 2d., and the expenditure £136 8s. 1d., the balance in hand being £32 14s. 2d., including £16 10s. 1d., brought from the preceding year's account. There has been an increase of income over the previous year of £22 15s. 5d., and of expenditure of £13 8s. 11d., and all the liabilities of the Institution have been discharged. The lectures have again been a source of pecuniary profit to the Institution, the receipts being £44 4s., and the expenses attendant thereon £38 4s. 6d., showing a net gain of £5 19s. 6d. The Committee have continued to issue ladies' lecture tickets, and they are happy to report with increased success, 59 having been purchased, being 16 more than were disposed of during the previous session. The following lectures were delivered with considerable success:—Miss Julia Bleaden, Mr. Alfred Nicholson, Mr. Henry Nicholson, "Musical Entertainment, entitled 'Operatic Sketches';" Mr. W. R. Birt, F.A.S., "Astronomy, 'A Night among the Stars,' (with Illuminated Diagrams);" Rev. E. L. Berthon, M.A., "On the Stereoscope and Camera;" Mr. George Dawson, M.A., "On Popular Proverbs, their wisdom, or want of it;" Rev. E. L. Berthon, M.A., "On the Glaciers of Switzerland;" Mr. Walter Rowton, "An Evening with Thomas Hood," (with Recitations); Rev. John Power, M.A., "On Infusorial Life;" Rev. H. H. Carlisle, B.A., "On the Life of George Stephenson;" Mr. A. Fairbairn and the Misses Bennett, Musical Entertainment, "A Night wth Burns." The Committee take the opportunity of officially recording the deep obligation the Institution is under to the Revs. E. L. Berthon, J. Power, and H. H. Carlisle, for their important gratuitous services, the latter gentleman having come from Southampton, at a very short notice, to supply the vacancy occasioned by the sudden indisposition of the former esteemed president, Dr. Andrew Clark. A concert was given in January last, for the benefit of the library, and a profit was realised of £6 6s. This sum, with other money, to the amount of £6 19s. 9d., was appropriated in the purchase of 69 volumes; 3 volumes have been presented, and 8 bound, making a total during the year of 80 volumes; and the Committee recommend that part of the balance in hand be immediately devoted towards the extension of this important department of the Institution. The librarian reports that 126 members have taken out books, and that the number of issues have been 1,062, showing an average of 8 volumes to each member. A Mutual Improvement Class and a Chemistry Class have been formed, and the first named class continued its meetings for a period of six months, with the most satisfactory results. The chemistry class was not attended with that success which had been anticipated. The formation and conducting of these classes entailed no expense upon the general fund of the Institution.

To Correspondents.

ERRATUM.—In last week's *Journal*, page 14, col. 2, near the bottom, for "To Mr. J. C. Morton . . . the Society's Medal," read "To Mr. J. C. Morton, . . . the Society's *Silver Medal*."

MEETINGS FOR THE ENSUING WEEK.

- MON. ...Royal Inst., 2. General Monthly Meeting.
Brit. Architects, 8.
Medical, 8½. Lettsomian Lectures, "On Medicine," Dr. Hare.
- TUES. ...Civil Engineers, 8. Discussion "On Submarine Telegraph Cables."
Pathological, 8.
Photographic, 8.
- WED. ...Society of Arts, 8. Mr. H. G. Collins, "On Electro-Block Printing, especially as applied to Enlarging or Reducing from any Printing Surface or Original Drawing."
Geological, 8. Prof. James Nicol, "On the Structure of the North-west Highlands of Scotland; and the Relations of the Gneiss, Red Sandstone, and Quartzite of Sutherland and Ross."
Pharmaceutical, 8.
Ethnological, 8.
- THURS. ...Roy. Soc. Club, 6.
Linnean, 8. Prof. Oliver, "On the natural order *Aurantiaceae*."
Chemical, 8.
Royal, 8½.
Antiquaries, 8½.
- FRI.Archæological Inst., 4.
- SAT. ...Royal Botanic, 3½.

PATENT LAW AMENDMENT ACT.

APPLICATIONS FOR PATENTS AND PROTECTION ALLOWED.

[From *Gazette*, November 23rd, 1860.]

- Dated 4th October, 1860.*
2402. J. A. Knight, 4, Symond's-inn, Chancery-lane—A new or improved mode of inflating air-mattresses and air-cushions. (A com.)
- Dated 18th October, 1860.*
2540. A. Debain, Place Lafayette, 24 and 26, Paris—A new or improved sounding apparatus applicable to all musical instruments having key-board.
- Dated 24th October, 1860.*
2593. W. R. Taylor, Paradise-house, Oxford—Imp. in rifle bolts.
- Dated 25th October, 1860.*
2599. E. Brefit, 61, King William-street—Imp. in the mode of packing bottles.
- Dated 27th October, 1860.*
2632. J. Ashby, Croydon, Surrey—Imp. in apparatus for cleaning grain before grinding, and in dressing the same after being ground.
- Dated 29th October, 1860.*
2640. T. Neal, Saint John-street, Smithfield—Imp. in grinding mills.
2644. A. V. Newton, 68, Chancery-lane—An improved washing machine. (A com.)
- Dated 30th October, 1860.*
2654. W. E. Newton, 66, Chancery-lane—Imp. in the production of alumina and salts of alumina. (A com.)
2656. J. H. Johnson, 47, Lincoln's-inn-fields—Imp. in rotatory engines. (A com.)
2658. T. Tribe, Princess-square, Kennington, Surrey—Imp. in ship's berths, bedsteads, and sofas.
- Dated 31st October, 1860.*
2660. W. Bull, Great George-street, Westminster—Imp. in the permanent way of railways and in connection therewith.
- Dated 2nd November, 1860.*
2681. H. Williamson, Coventry—Imp. in silver watch cases.
2682. W. Clark, 53, Chancery-lane—Imp. in steam generators. (A com.)
2683. J. J. G. Taylor, 12, Mark-lane—An imp. in the separation of siliceous and other matters from steel.
2685. G. Hamilton, 3, Royal Exchange—Imp. in locks.
2687. R. A. Brooman, 166, Fleet-street—Imp. in machinery for felt-ing threads and other filamentous substances. (A com.)
2689. W. E. Newton, 66, Chancery-lane—An imp. in preparing compounds of india-rubber, gutta-percha, and allied gums. (A com.)
- Dated 3rd November, 1860.*
2692. G. Roberts, Openshaw, near Manchester—Imp. in the construction of steam boilers, and in the flues connected therewith.
2693. W. Durham, Loanhead, Mid-Lothian, N.B.—Imp. in preparing materials for the manufacture of paper.

2695. S. Webb, T. Timmins, and R. Brough, Birmingham—New or improved machinery for the manufacture of nails, spikes, and staples.
2697. G. Shillibeer, City-road, and G. Giles, Fenchurch-buildings—Imp. in the construction of omnibuses and other vehicles.
2699. T. Wrigley, Bridge Hall Mills, near Bury, Lancashire—Imp. in apparatus for filtering water and other liquids.
2700. G. Hinton, Oldbury, Worcestershire—Imp. in the manufacture of iron, steel iron, and steel from certain waste products, and in the machinery or apparatus to be employed in such manufacture, which imps. are also applicable to the re-melting of large lumps of iron or steel.
2701. W. Edwards, Birmingham—Imp. in fire screens or guards.
2702. P. Spence, Newton Heath, near Manchester—Imp. in separating copper from its ores.
2703. J. Mitchell, Keighley, Yorkshire—Imp. in the manufacture of cast-iron pipes, tubes, rollers, and similar work.
- Dated 5th November, 1860.*
2704. Sir P. Fairbairn, Knt., and R. Newton, Leeds—Improved machinery for heckling flax and hemp.
2705. W. Langshaw, Egerton, near Bolton, Lancashire—Imp. in the means or method of polishing or finishing yarns or threads.
2706. G. Davies, 1, Serle-street, Lincoln's-Inn—Imp. in travelling bags. (A com.)
2707. E. F. Prentiss, Philadelphia—Imp. in the combination of chemical materials forming a mordant for dyeing wool and woollen goods.
2709. J. Lancaster, Garden Farm, Dunmurry, Belfast—An improved mowing and reaping machine.
2710. J. Ridley, Stagshaw, Northumberland—Imp. in reaping and mowing machines.
2711. J. Webster, Birmingham—Imp. in obtaining gas (mainly oxygen) for improving artificial light, and for other purposes, also for utilizing the products resulting from its manufacture.
2712. B. Seed, Great Horton-lane, Bradford—Imp. in apparatus used in the treatment of soap ruds or other saponaceous or oily matters, which apparatus is also applicable in the treatment of other matters.
- Dated 6th November, 1860.*
2716. J. Froggatt, jun., 6th, Nottinghamsire—An imp. in apparatus for burning gas.
2720. W. Pearce, Poole, and E. Bowles, Little Canford—Imp. in apparatus for ploughing land.
2722. H. Thornton, Wardington, Oxon—Imp. in sheds for sheep.
2726. E. Howe, jun., Oxford-street—Imp. in projectiles. (A com.)
2728. J. Higgins, Salford, Lancashire, and T. S. Whitworth—Imp. in machinery or apparatus for preparing cotton and other fibrous materials for spinning.
- Dated 7th November, 1860.*
2733. W. Cooke, Charing-cross—Imp. in ventilating.
2735. J. Clark, 447, Strand—Imp. in outside shop-lights.
2736. W. K. Hydes, Liverpool—Imp. in steam engines and boilers, and in the mode or method of forming or shaping sheets or plates of metal for certain parts of the same.
2737. J. and E. Radcliffe, Birmingham—Certain imp. in lamps for lighting vestibules, halls, or other like places.
2738. R. Dressel and P. Levestamm, New Oxford street—Imp. in stoves.
2739. J. Church, Boxworth, Cambridgeshire—A brick and tile machine.
2740. R. A. Brooman, 166, Fleet-street—Imp. in liquid and fluid meters. (A com.)
2741. S. Fox, of Deepcar, near Sheffield—Imp. in furnaces used in melting steel and other metals where crucibles or pots are employed.
2742. A. J. Sedley, 210, Regent-street—Imp. in chairs, sofas, and other articles of furniture, used to sit or recline upon.
2743. W. E. Newton, 66, Chancery-lane—Improved apparatus for obtaining motive power from air. (A com.)
2744. I. Maiden and E. Hall, Ashton-under-Lyne—Imp. in slide valves for steam engines.
2745. A. V. Newton, 66, Chancery-lane—An improved mode of, and apparatus for, sewing. (A com.)
- Dated 8th November, 1860.*
2747. F. C. Husson, Paris—Imp. in power looms.
2749. H. J. Distin, 9, Great Newport-street, Leicester-square, and A. H. Siebe, 12, Baker-street, Portman-square—Imp. in instruments for determining the movements of musical compositions, and which are also applicable for other purposes.
2751. J. Rollinson, Pensnett, and W. Rollinson, Brierley-hill, Staffordshire—An imp. or imps. in working the brakes of winding engines.
2752. T. P. Bennett, Gilnow Mills, Bolton-le-Moors, Lancashire—Certain imp. in or applicable to mules for spinning.
2753. F. Preston and T. Kennedy, Kilmarnock, Ayr, N.B.—Imp. in projectiles for fire-arms and ordnance.
2754. G. Simpson, Glasgow, Lanark, N.B.—Imp. in pumps.
2755. J. Gillies, Glasgow, Lanark, N.B.—Imp. in valves for steam engines.
2756. J. Aitken, Dalry, Ayr, N.B.—Imp. in clocks.
2757. A. V. Newton, 66, Chancery-lane—Imp. in the construction of sewing machines. (A com.)
2758. E. Westhead, Manchester—Imp. in boiling or evaporating soap, saline solutions, or other liquid substance.
- Dated 9th November, 1860.*
2761. J. Chesterman, Sheffield—Imp. in tents, marquees, and other like articles, parts of which are applicable to umbrellas and parasols, also in machinery for manufacturing parts thereof.
- Dated 10th November, 1860.*
2763. W. Spence, 50, Chancery-lane—Imp. in breach-loading fire-arms. (A com.)
2765. F. Trouvé, 4, Rue de Bouloi, Paris—A system of publicity called "Nemento agenda," otherwise an illustrated general cabinet and pocket agenda.
2767. J. Glen, Glasgow—Imp. in machinery, apparatus, or means for engraving or producing printed surfaces.
- Dated 12th November, 1860.*
2769. J. T. Pedder, 85, Murray-street, New North-road, Hoxton—A machine for the preservation of life in case of fire in dwelling-houses and other buildings.
- Dated 13th November, 1860.*
2773. J. Wood, Manchester—Imp. in threading needles for embroiderying machines, and also an improved method of working the same.
2775. M. A. F. Mennons, 39, Rue de l'Echiquier, Paris—An improved manufacture of coverings for the head. (A com.)
2777. M. L. Henrionnet and L. O. Boblique, 39, Rue de l'Echiquier, Paris—Imp. in the treatment of fossil and other mineral phosphates of lime.
2779. J. Williams, St. Anne's-street, Salisbury—An improved method of obtaining and applying motive power.
2781. W. Roberts, Millwall, Poplar—Imp. in pumps.
2785. A. Deroide and V. Dupouy, Paris—An improved method and apparatus for bleaching all descriptions of vegetable textile fabrics and yarns.
- Dated 14th November, 1860.*
2787. W. Brookes, 73, Chancery-lane—Imp. in means and apparatus employed in weaving.
2789. R. Furnival, Manchester—Imp. in machinery or apparatus for cutting paper, textile fabrics, and other articles or materials.
2791. W. Robertson and J. M. Hetherington, Manchester—Certain imp. in mules for spinning.
2793. Captain T. A. Blakely, R.A., Hollywood, Down—An improved method of increasing the strength of steel and wrought iron.
2795. S. Ling, Heywood, Lancashire—Imp. in apparatus for lubricating steam engines.
2797. J. F. Reeves, 11, Walpole-street, Chelsea—Imp. in the manufacture of paper.
- INVENTION WITH COMPLETE SPECIFICATION FILED.
2835. H. Ford, Birmingham—Imp. in coating or enamelling paper, pasteboard, cardboard, cloth, silk, and other similar fabrics. 19th November, 1860.

PATENTS SEALED.

[From Gazette, November 23rd, 1860.]

November 23rd.

- | | |
|------------------------------------|----------------------|
| 1286. T. Johnson. | 1341. C. Aldin. |
| 1298. T. Dickens and G. McCulloch. | 1344. J. Kinniburgh. |
| 1308. S. Chatwood. | 1395. J. Brown. |
| 1309. G. Robinson. | 1404. W. C. Ark. |
| 1317. C. Schiele. | 1424. R. Romaine. |
| 1322. W. Jones. | 1500. F. Preston. |
| 1326. J. Traves. | 1648. H. Disston. |
| 1327. H. Hughes. | 1676. P. Pizzi. |
| 1328. A. J. Paterson. | 1729. G. Spencer. |
| 1329. R. H. Collyer. | 1974. A. Lely. |
| 1339. S. Rowbotham. | 2070. C. Mather. |
| | 2260. W. E. Newton. |

[From Gazette, November 27th.]

November 26th.

- | | |
|---|-------------------------------|
| 1306. G. Dowler & G. J. Farmer. | 1369. J. Pinches. |
| 1350. T. Cresswell and H. Lister. | 1405. E. Michel-Sainton. |
| 1356. W. Stratford. | 1425. J. Combe. |
| 1357. C. W. Lancaster, J. Brown, and J. Hughes. | 1437. T. Willis and G. Chell. |
| | 1443. G. Chatlin. |
| | 2317. J. L. Budden. |

PATENTS ON WHICH THE STAMP DUTY OF £50 HAS BEEN PAID.

[From Gazette, November 23rd, 1860.]

November 19th.

- | | |
|--------------------------------|--------------------------------|
| 2908. D. Melvin. | November 21st. |
| | 2930. W. McFarlane. |
| 2995. J. Francis and C. Manby. | 2945. A. Martin and J. Martin. |

[From Gazette, November 27th, 1860.]

November 22nd.

- | | |
|------------------|-------------------------------------|
| 2929. S. Riley. | 2958. S. B. Wright and H. T. Green. |
| 2939. W. Searby. | November 24th. |
| | 2950. W. Blinkhorn. |

PATENTS ON WHICH THE STAMP DUTY OF £100 HAS BEEN PAID.

[From Gazette, November 27th, 1860.]

November 23rd.

- | | |
|---------------------|-------------------|
| 2737. S. C. Lister. | November 24th. |
| 2745. W. L. Brook. | 2757. J. Stenson. |